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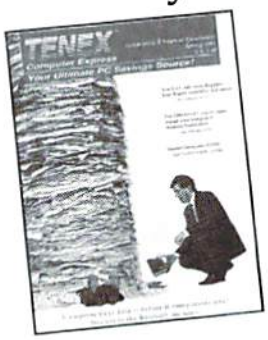

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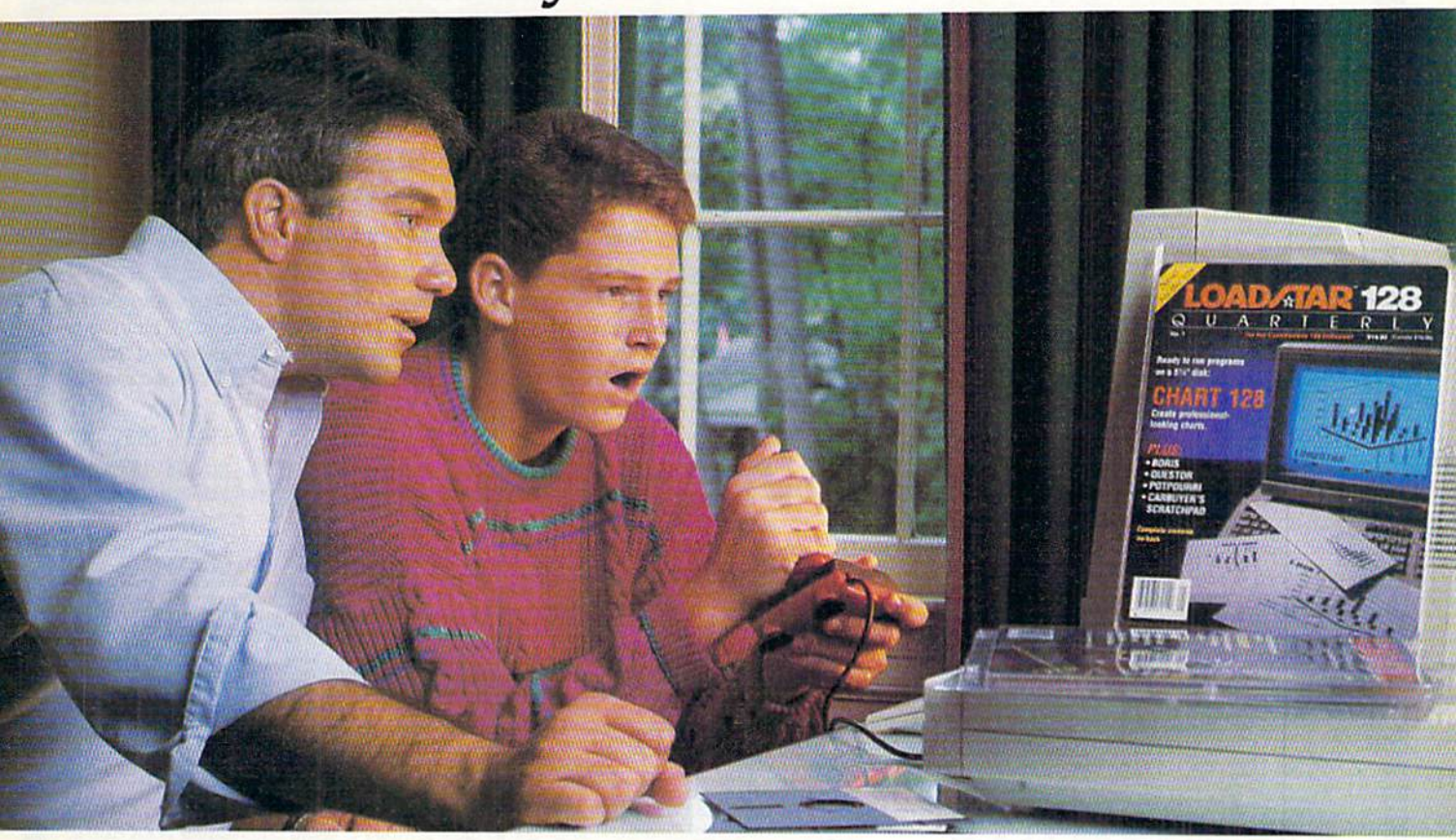

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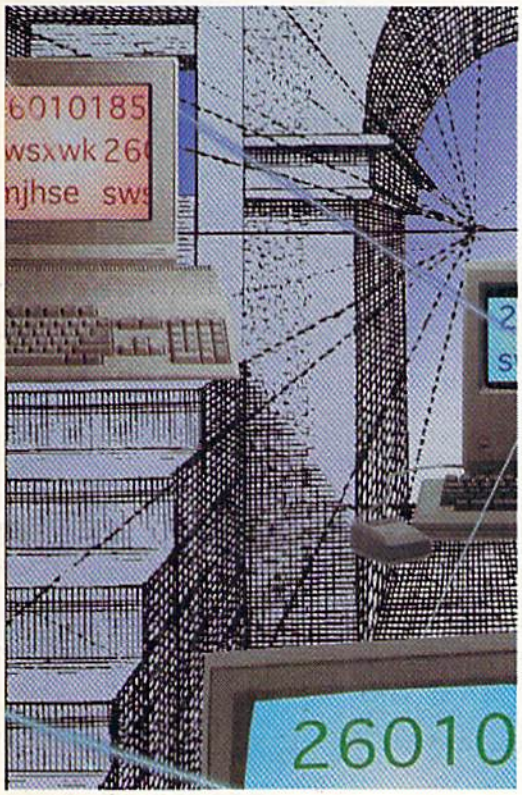

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*** If typing in program listings is almost as much fun for you as RUNning after a school bus, order this issue's programs on the September/October ReRUN disk. Just call 800-343-0728.**

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RUNning Ruminations

IBM Envy

Q: What's the difference between an IBM user and a Commodore user?
A: The IBM user agonizes over which laser printer to buy, while the CBM user hopes to get more mileage from his dot-matrix ribbon by soaking it with WD-40.

I was reminded of this joke after reading this issue's feature article about transferring files among computers. The Commodore 64/128 remains the best computer for the home user, but there's no reason to eschew some of the more useful files that exist in MS-DOS or other platform formats.

We were encouraged by numerous *RUN* readers to take a look at different ways the C-64/128 can communicate with other computers. At work, school or for their own enjoyment, these readers find it useful to transfer files between computer formats or to use Amiga or Macintosh artwork. You *can* transfer files—graphics and text files—to and from the "big boys." This is good news for those of us who have invested time and effort in our systems and who have libraries of software and various peripherals.

Sharing files is a marvelous elixir, guaranteed to alleviate any pangs of "IBM Envy."

Sharing files is a marvelous elixir, guaranteed to alleviate any pangs of "IBM envy." It satisfies the lust for increased speed, additional memory or improved graphics and prolongs the life of your current system. It also eliminates the learning curve involved in upgrading to another platform. Best of all, you don't have to suffer through retyping all your files!

Other Topics

GEOS owners will want to turn to our report on some truly addictive games that run under GEOS, as well as our review of **gateWay**, the alternative GEOS deskTop from Creative Micro Designs.

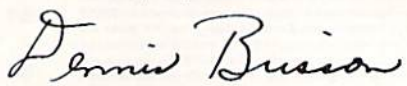
Speaking of reviews, we take a look at two of the hottest paint and draw programs on the C-128 market today, as well as the **Super Cartridge**, a collection of utilities on a plug-in cartridge.

With the proliferation of camcorders, more and more people are making their own home videos. Did you know that you can spice up your great scenes . . . with your C-64? We'll show you how.

This issue's blockbuster program features the programming talents of Robert Rockefeller, creator of the popular **RUN Script** and **RUN Paint** programs. **MultiCopy** is a many-featured copy program that may be the *last* file duplication program you ever need. It supports up to three drives, both the 64 and 128 (in 40- and 80-columns), has a number of useful commands and sets the time and date for each file.

Contest Deadline

We've received a tremendous response to our writing contest (see the May/June '91 issue), but there's still time for yours . . . if you hurry. Remember, all entries are due in our hands by September 1.



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This excellent alignment program is a must-have for every Commodore owner. Easy to use, it helps you to align your drive so that it runs just as if it were new! The simple instructional manual and on-screen help prompt you through the alignment procedure and help you adjust the speed and head stop of your drives. It even includes instructions on how to load the alignment program when nothing else will load!

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MAGIC

These file-management utilities will make password-protected autoboot files, convert sequential files into program files, automatically verify your saves, and more.

By TIM WALSH

$5CF AUTO VERIFY 64

If you've ever lost a program due to a disk error or other problem, then you'll be interested in this small machine language utility. Auto Verify 64 automatically verifies any Basic file after it is saved to disk.

To use it, just type it in, save to disk, then run it. Auto Verify 64 is then activated with SYS 832 before each use. Pressing RUN-STOP/RESTORE deactivates it. Auto Verify 64 is also compatible with all fastloaders and cartridges.

```
Ø REM AUTO VERIFY 64 - JOE MIGUEL  :REM*85
1Ø FORJ= 832 TO 935:READQ:POKEJ,Q:NEXT
                                   :REM*76
2Ø SYS832:PRINT:PRINT"AUTO VERIFY ACTIVATE
   D":NEW                          :REM*1Ø7
3Ø DATA12Ø,173,5Ø,3,141,1Ø7,3,173,51,3,141
   ,1Ø8,3,169,99,141               :REM*182
4Ø DATA5Ø,3,169,3,141,51,3,88,96,6,69,82,8
   2,79,82,255                     :REM*17Ø
5Ø DATA79,75,255,234,169,111,72,169,3,72,3
   2,111,223,1Ø4,1Ø4,234           :REM*225
6Ø DATA169,1,162,255,16Ø,255,32,213,255,32
   ,183,255,2Ø1,64,24Ø,8           :REM*227
7Ø DATA169,Ø,141,89,3,76,141,3,169,6,141,8
   9,3,234,24,169                  :REM*132
8Ø DATA13,32,21Ø,255,174,89,3,189,9Ø,3,2Ø1
   ,255,24Ø,7,232,32               :REM*246
9Ø DATA21Ø,255,76,151,3,234,96,Ø   :REM*37
```

—JOE MIGUEL, ST. LOUIS, MO

$5D0 SUPERBOOTER 64

Superbooter 64 isn't just another autoboot program creator for the C-64; it also provides password protection to your programs.

To use Superbooter 64 with your own programs, just type it in and set A$ in line 10 to any password you want, using the following syntax: A$="PASSWORD". Once typed in and saved, run Superbooter 64 and then load the Basic program that you want to modify with autobooting and password protection. Then save the program again, preferably under a different name.

Your program will now load and run automatically, using the syntax: LOAD "FILENAME",8,1. Since it's an autoboot file, there's no need to type run to execute the program.

Once running, press the RUN/STOP key to pause the program. Superbooter is awaiting the password, which you had previously assigned to A$ in line 10. Enter the password and the RUN/STOP key will function normally.

```
Ø REM SUPERBOOTER 64 - JEFF MARTIN:REM*139
1Ø A$="*YOUR PASSWORD GOES HERE*":REM ***
   CHANGE PASSWORD BEFORE USING ***
                                   :REM*212
2Ø FORI=828TO998:READD:C=C+D:POKEI,D:NEXTI
                                   :REM*1ØØ
3Ø IF C<>2Ø7Ø5 THENPRINT"ERROR IN DATA..."
   :END                            :REM*1ØØ
4Ø IFLEN(A$)>25THENPRINT"PASSWORD TOO LONG
   !":END                          :REM*47
5Ø IFA$<>""THENFORI=1TOLEN(A$):POKE997+I,A
   SC(MID$(A$,I,1)):NEXTI:POKE997+I,Ø
                                   :REM*21
6Ø POKE8Ø4,6Ø:POKE8Ø5,3:POKE818,125:POKE81
   9,3                             :REM*173
7Ø DATA 165,184,24Ø,58,169,237,141,5Ø,3,16
   9,245,141,51,3,169,87,141,36    :REM*24
8Ø DATA 3,169,241,141,37,3,169,1,133,43,16
   9,8,133,44,169,143,141,4Ø,3     :REM*41
9Ø DATA 169,3,141,41,3,133,198,169,82,141,
   119,2,169,117,141,12Ø,2,169     :REM*243
1ØØ DATA 13,141,121,2,1Ø8,2,3,76,87,241,16
    9,147,32,21Ø,255,6,157,169,36  :REM*221
11Ø DATA 133,193,169,3,133,194,76,237,245,
    165,145,2Ø1,127,2Ø8,71,162,7   :REM*143
12Ø DATA 189,1,128,157,52,3,2Ø2,2Ø8,247,18
    9,223,3,157,2,128,232,224,7    :REM*251
13Ø DATA 2Ø8,245,169,23Ø,133,36,169,3,133,
    37,16Ø,Ø,132,38,32,228,255,24Ø:REM*157
14Ø DATA 251,164,38,2Ø9,36,2Ø8,15,2ØØ,177,
    36,2Ø8,238,169,237,141,4Ø,3     :REM*63
15Ø DATA 169,246,141,41,3,162,7,189,52,3,1
    57,1,128,2Ø2,2Ø8,247,16Ø,88,96:REM*237
16Ø DATA 92,3,195,194,2Ø5,56,48,Ø  :REM*71
```

—JEFF MARTIN, ROSEVILLE, CA

$5D1 KALEIDOSCOPE 128

Watch your C-128's 40-column screen weave its way into wild kaleidoscope patterns with Kaleidoscope 128. Kids will especially enjoy the popular children's song that plays between each changing of the screen colors.

Since it'll create patterns and colors indefinitely, Kaleidoscope 128 is especially handy for adding a little ambiance to children's parties or even adult parties.

```
Ø REM KALEIDOSCOPE MUSIC 128 - SANFORD FEL
  DMAN                             :REM*115
1Ø GRAPHIC 1,1:COLOR 1,1:COLOR 4,1::REM*91
2Ø FOR I=1 TO 3:CIRCLE 1,X1,X2,Y1,Y2
                                   :REM*199
3Ø T=1Ø:S=57:C=INT(((RND(1))*16)+1)*1
                                   :REM*17Ø
4Ø COLOR 1,C                        :REM*2
5Ø X1=INT(((RND(1))*S)+C)*T        :REM*63
6Ø X2=INT(((RND(1))*S)+7)*T        :REM*252
7Ø Y1=INT(((RND(1))*S)+C)*T        :REM*192
8Ø Y2=INT(((RND(1))*S)+3)*T        :REM*2Ø7
9Ø BOX 1,B3,B4,3,4,35Ø             :REM*134
1ØØ B3=INT((((RND(1)*77)+1)*T))    :REM*82
```

```
11Ø B4=INT((((RND(1)*S)+9)*T))      :REM*58
12Ø O3=INT((((RND(1)*77)+1)*T))     :REM*125
13Ø O4=INT((((RND(1)*S)+5)*T))      :REM*25
14Ø WIDTH 2:BOX 1,HI,LO,UP,DN,3Ø:CIRCLE 1,
    HI,LO,UP,DN                     :REM*246
15Ø HI=INT(((RND(1))*(6*T))+1)*T    :REM*231
16Ø LO=INT(((RND(1))*(4*T))+1)*T    :REM*27
17Ø UP=INT(((RND(1))*(6*T))+1)*T    :REM*214
18Ø DN=INT(((RND(1))*(4*T))+1)*T    :REM*225
19Ø NEXT                            :REM*65
2ØØ ENVELOPE 9,9,2,1,4,1,777:VOL 15:TEMPO
    13                              :REM*168
21Ø A$="QGEHGQGEHGQAGFEQDEFIEFQGC":REM*1ØØ
22Ø B$="ICCQCICDEFHGQGDDFEDWC"      :REM*18
23Ø PLAY A$:PLAY B$:GOTO 2Ø         :REM*174
```

—Sanford Feldman, Phoenix, AZ

$5D2 File Counter 64

Keep track of all the files on your disks by filetype, including program, sequential, relative and user files, with File Counter 64. Once the program is typed and saved, just run it. When you want a tally of all the files on a disk, just place it in the drive and enter SYS 49152.

File Counter 64 counts up to 144 files, making it an ideal utility for the Commodore 1541 and 1571 drives. Please note that while it will work with 3½-inch disks, if you have more than 144 files on a disk in the Commodore 1581 disk drive, there may be some discrepancies in the total number of files.

```
Ø REM FILE COUNTER 64 - MICHAEL MYERS
                                    :REM*1Ø9
1Ø FOR T= 49152 TO 49445:READ D:POKE T,D:C
   K=CK+D:NEXT                      :REM*88
2Ø IF CK <> 33525 THENPRINT"ERROR IN DATA.
   .":END                           :REM*245
3Ø SYS 49152                        :REM*2Ø4
4Ø DATA 169,Ø,133,251,168,153,27,193,2ØØ,1
   92,1Ø,2Ø8,248,169,36,133,169     :REM*251
5Ø DATA 169,48,133,17Ø,169,2,162,169,16Ø,Ø
   ,32,189,255,169,8,162,8,16Ø,Ø    :REM*9Ø
6Ø DATA 32,186,255,32,192,255,162,8,32,198
   ,255,32,2Ø7,255,32,2Ø7,255       :REM*5
7Ø DATA 16Ø,Ø,32,2Ø7,255,72,32,183,255,2Ø1
   ,64,24Ø,62,1Ø4,153,37,193,2ØØ    :REM*98
8Ø DATA 192,32,2Ø8,236,165,251,2Ø8,5,23Ø,2
   51,76,53,192,16Ø,22,2ØØ,185      :REM*13
9Ø DATA 37,193,2Ø1,32,24Ø,248,238,35,193,2
   Ø1,8Ø,2Ø8,3,238,27,193,2Ø1,83    :REM*236
1ØØ DATA 2Ø8,3,238,29,193,2Ø1,82,2Ø8,3,238
    ,31,193,2Ø1,85,2Ø8,3,238,33     :REM*22Ø
11Ø DATA 193,76,53,192,169,218,16Ø,192,32,
    3Ø,171,174,27,193,173,28,193    :REM*193
12Ø DATA 32,2Ø5,189,169,231,16Ø,192,32,3Ø,
    171,174,29,193,173,3Ø,193,32    :REM*4Ø
13Ø DATA 2Ø5,189,169,244,16Ø,192,32,3Ø,171
    ,174,31,193,173,32,193,32,2Ø5   :REM*238
14Ø DATA 189,169,1,16Ø,193,32,3Ø,171,174,3
    3,193,173,34,193,32,2Ø5,189     :REM*188
15Ø DATA 169,14,16Ø,193,32,3Ø,171,174,35,1
    93,173,36,193,32,2Ø5,189,1Ø4    :REM*69
16Ø DATA 169,8,32,195,255,32,2Ø4,255,96,13
    ,8Ø,82,71,32,7Ø,73,76,69,83,58  :REM*25
17Ø DATA 32,Ø,13,83,69,81,32,7Ø,73,76,69,8
    3,58,32,Ø,13,82,69,76,32,7Ø,73:REM*22Ø
18Ø DATA 76,69,83,58,32,Ø,13,85,83,82,32,7
    Ø,73,76,69,83,58,32,Ø,13,65,76:REM*2Ø5
19Ø DATA 76,32,7Ø,73,76,69,83,58,32,Ø,Ø,Ø,
    Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø               :REM*58
```

—Michael Myers, Beardstown, IL

$5D3 Sequential Converter 64/128

My program, Convert Sequential to Program Files 64/128, will read in a sequential file and properly convert it to a program file. The resulting file is compatible with most word processors that can read program files, such as RUN Script and PaperClip.

First enter the name of the sequential file that you want to convert and the name of the program file that you want to create. Sequential Converter keeps you posted of its progress as it performs the conversion, and then it informs you when the process is complete.

```
Ø REM CONVERT SEQ TO PRG FILES 64/128 - WA
  RD SHRAKE                         :REM*1Ø3
1Ø PRINT:INPUT"INPUT FILENAME";A$ :REM*14Ø
2Ø INPUT"OUTPUT FILENAME: ";B$:PRINT
                                    :REM*15
3Ø E=Ø:F=9:PRINT"{5 CRSR RTs}{2 SPACEs}CHA
   RACTERS CONVERTED."              :REM*27
4Ø DD=8:OPEN15,DD,15                :REM*66
5Ø OPEN2,DD,2,"Ø:"+A$+",S,R":REM SEQ
                                    :REM*188
6Ø OPEN3,DD,3,"Ø:"+B$+",P,W":REM PRG
                                    :REM*75
7Ø GET#2,C$:G=ST:D=ASC(C$+CHR$(Ø)):REM*255
8Ø IFD>192ANDD<219THEND=D-128:GOTO11Ø
                                    :REM*7
9Ø IFD>64ANDD<91THEND=D-64:GOTO11Ø :REM*82
1ØØ IFD=13THEND=159                 :REM*242
11Ø PRINT#3,CHR$(D);                :REM*1Ø5
12Ø E=E+1:IFE>FTHENF=F+1Ø:PRINT" {CRSR UP}
    ";E                             :REM*178
13Ø IFG<>64THEN7Ø                   :REM*167
14Ø PRINT#3:PRINT"{CRSR DN}ALL DONE."
                                    :REM*2Ø5
15Ø CLOSE2:CLOSE3:CLOSE15           :REM*23Ø
16Ø END                             :REM*33
```

—Ward Shrake, Covina, CA

$5D4 Keypress Flash 64

Tired of the same old sedate screen border? This program, Keypress Flash 64, is guaranteed to catch anybody's attention. An interrupt-driven program, it causes the screen border to flash with every press of a key on the C-64.

It also runs in either Program or Direct mode and is activated with SYS 49152. To deactivate, just press the RUN-STOP/RESTORE key combination.

```
Ø REM KEYPRESS FLASH 64 - CHARLES R. JONES
  II                                :REM*72
1Ø FOR T=49152 TO 4918Ø:READ D:POKET,D:NEX
  T                                 :REM*51
2Ø SYS49152                         :REM*186
3Ø DATA 12Ø,162,13,16Ø,192,142,2Ø,3,14Ø,21
   ,3,88,96,173,2Ø3,Ø,2Ø1,1ØØ,2Ø8   :REM*42
4Ø DATA 3,76,49,234,141,32,2Ø8,76,49,234
                                    :REM*183
```

—Charles R. Jones II, Picayune, MS ■

News and New Products

Two new software products from Disney, a super-quiet printer from Panasonic and big plans for new C-64 entertainment software from Konami.

By JANICE GREAVES

Arachnophobia

BURBANK, CA—If you've ever been frightened by a spider, here's your chance to get even. Disney Software has released **Arachnophobia** for the C-64, inspired by its namesake movie. In it, a venomous South American spider has left a trail of deadly offspring. Your mission is to track down the unwanted visitor and eliminate him before his trail of destruction engulfs the country.

You'll search thousands of locations, fighting your way through 12 types of spiders, stomping, spraying, frying and outwitting them. If you defeat the South American spider, you earn a special assignment in the Amazon Jungle. Disney enhanced the game with real speech, music and sound effects.

This game is available for $29.95 from Walt Disney Computer Software, Inc., 500 S. Buena Vista St., Burbank, CA 91521.

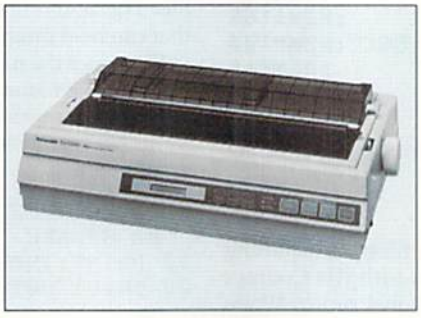
Dick Tracy Print Kit

BURBANK, CA—Also from Disney Software, the **Dick Tracy Crimestoppers Print Kit** is now available for the C-64. The kit features over 50 crimestopper images of your favorite Dick Tracy characters, such as Flattop, Big Boy, Lips Manlis and Pruneface. There are 15 different borders to enhance your creations. Six typefaces are included, as well as instructions for special projects such as wrist radios, masks and greeting cards.

The Dick Tracy Print Kit supports a variety of printers. You can order it for $19.95 from Walt Disney Computer Software, Inc., 500 S. Buena Vista St., Burbank, CA 91521.

Panasonic Says "Shhhhhh!"

SECAUCUS, NJ—Panasonic has set a new low-noise standard for dot-matrix printers with the KX-P2624. Using a combination of noise-reduction technologies, the KX-P2624 features quieter operation than traditional low-end dot-matrix printers. And with a maximum print speed of 300 characters per second (cps) it accomplishes the task without sacrificing print speed.



Panasonic's KX-P2624 dot-matrix printer sets a new standard of quiet operation.

The KX-P2624 offers a super-letter-quality text font with double the character matrix of letter-quality fonts. It has a total of 11 fonts, including seven LQ fonts, and can print 300 characters per second in draft mode, 100 cps in LQ mode and 40 cps in SLQ mode.

As with other Panasonic printers, the KX-P2624 offers multiple paper paths, an adjustable push-pull tractor and paper parking. It has an expandable 26K buffer. Panasonic's suggested retail price is $699.95. For further information, call 800-742-8086.

New Titles from Konami

BUFFALO GROVE, IL—Konami is developing four new entertainment packages for the Commodore 64, to be released early this fall.

It's back to the old west in **Back to the Future III**, the sequel to their super game Back to the Future II. (See the review of Back to the Future II in *RUN* July/August '91.) Back to the Future III will feature many levels of progressive difficulty set in the Old West. Each level is inspired by scenes from the movie, so you may have an advantage if you've seen it.

As players assume the roles of Marty McFly and Doc Brown at various stages of the game, it's up to them to return everyone safely to their own time. But Buford "Mad Dog" Tannen isn't going to make it easy. Gamers encounter a buckboard chase, shooting gallery, pie throwers and a train chase.

In **Predator 2**, players take the role of Mike Harrigan, an L.A. cop determined to see justice prevail against drug lords. But there's something else out there more deadly than all of the drug lords put together: an alien predator who hunts man for sport and is armed with a laser-guided energy weapon. The object of the game is to survive all the levels and confront the predator on his own territory.

The Teenage Mutant Ninja Turtles Arcade Game is also soon to be released. Based on the coin-op game, it features action on the streets and in the sewers of New York City. Players select their favorite Turtle and fight to save April O'Neil. Each Turtle uses his best weapon and moves and fights at a different rate of speed. The game is packed with Shredder's Foot Clan members to keep players occupied through the seven levels of play and has a two-player simultaneous play option.

For Bart Simpson fans, **Simpsons' Arcade** is a C-64 conversion of the newly released coin-op hit. Players, acting on behalf of Homer, Marge, Lisa and Bart, must rescue baby Maggie, who has been kidnapped by thieves in pursuit of a stolen diamond. Using the Simpsons' household items, such as Marge's vacuum and Lisa's jump rope, the family members fend off the thieves to ultimately rescue Maggie.

Konami has slated these games for release this fall. For more information, contact Konami, Inc., 900 Deerfield Parkway, Buffalo Grove, IL 60089.

New Publisher for *Twin Cities 128*

SALEM, MA—The *Twin Cities 128 Magazine* has been sold to John Brown, president of PARSEC, Inc., a vendor of programs and products for Commodore 8-bit computers. A new expanded format is planned and issues will appear bimonthly. For more information, contact PARSEC, Inc., PO Box 111, Salem, MA 01970. ■

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MAIL RUN

Issues and answers for RUN readers. PLUS a special section dedicated to our list of Commodore user's groups.

OUTTA THIS WORLD

Is this earth? I must've gotten off on the wrong planet. How can it be that I bought my 1764 RAM expansion unit with 256K and the heavy duty power supply for only $79 from *RUN* (March/April '91). It arrived intact, REU, disk, docs, box and all, and works just fine. Too good to be true. I keep waiting for the illusion to fade. I thought I was lucky to get the Super Snapshot v4 for $20 from *RUN*, but this is too much.

If you're a GEOS 2.0 fan, and I've been one since v1.2, you're gonna like this unit. GEOS becomes "Gee Everything Operates Smoothly" (now). I have a 1581 and a 1541 and with the REU everything goes much faster. Set the 1541 to drive A and configure it to Shadow, and the 1581 to drive B. Then select RAM Reboot. For some reason, selecting this speeds everything up.

Also, select DMA for A "MoveData." You don't have to save the Config file to either drive. You won't get any system errors because of missing Config files with the REU. The applications will cross drives of different types, even if you just select the application icon or the file icon for that application. Wait until you see how smoothly and quickly you can scroll around in geoPaint. Whew! How does *RUN* manage to get these super deals? Keep 'em coming!

—JOHN ELLIOTT
DALY CITY, CA

Thanks for the plug, but unfortunately our supply of 1764s is long gone. Word has it, however, that they're still available through the mail-order houses.

—EDITORS

COPYRIGHT CONCERNS

Your idea of a BookDisk (May/June '91) is intriguing, but your contest has several flaws. The two major ones are these: First, every contribution to *RUN* requires a sale of the author's copyright. Winning the contest would be hollow if my BookDisk was no longer mine. And even if this were not the case, there is the second flaw: I couldn't publish the BookDisk anywhere but in *RUN*.

—GLENN PARKS
WASHINGTON, NJ

Perhaps it wasn't clear from the article, but rest assured that you own the copyright to any writing you generate using the BookDisk program. RUN *(as with any publisher) owns the copyright only if a story is selected for publication in the magazine or on disk.*

Winners will be chosen on the basis of originality, entertainment/information value and the quality of writing. I hope this clarifies any confusion, and we look forward to receiving your entry.

—EDITORS

NY BBS?

I recently purchased a Commodore 1660 modem for my C-64. I have been looking for a BBS close to me. Can you help?

—THOMAS BONGIORNO
SHIRLEY, NY

Hey readers, any advice for Thomas???

—EDITORS

WHAT'S A DONGLE?

I recently picked up a Commodore 64 at a thrift store. It came with a few disks and accessories. Among the things in the box was a small gray device which seems to plug into the joystick port. The only words written on it are "PaperClip 64 Spellpack."

Although I tried to find a PaperClip program at my local software store, I was unable even to identify the company. Can you tell me what this thing is, how I might go about using it, and if I would even want to?

—LOUIS JAWITZ
NEW YORK, NY

The device you have is probably what's called a dongle, and it is merely a form of copy protection. Which means that in order to use the PaperClip 64 Spellpack, you would have to first insert that device into the joystick port; otherwise it wouldn't run. However, since you don't have the program, you can safely pitch the dongle into the trash can.

PaperClip is a popular word processor that is published by Electronic Arts. It is available for less than $35 from the mail order houses that advertise in RUN.

—EDITORS

SOURCE FOR COMMODORE MANUALS

I recently purchased a Commodore 1526 printer for my C-64. Where can I get a manual for this printer?

—RANDY EVILSIZOR
SPRINGFIELD, OH

You can order that manual directly from Commodore Express, the customer service line of Commodore Business Machines. Their number is 800-448-9987. The manual will cost about $10.

In fact, manuals are available from most hardware manufacturers for minimal cost. If the manufacturer is no longer in business, try your local libraries and user's groups.

—EDITORS

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Times are lonely for CBM 8-bit users, and although I now use everything from PCs to a UNISYS mainframe in my profession, I doubt that I will ever abandon either my 64/GEOS home environment or *RUN*.

However, on page 22 of your May/June '91 issue, author Mark Jordan stated that the cost for copyrighting is $10. The price went up this year to $20.

Keep on RUNning!

—RICH LA BONTE
HOLLYWOOD, CA

DISKWILL DILEMMA

In the March/April Commodore Clinic there was a question concerning do-it-yourself will programs for the C-64. The answer was TENEX and a program called DiskWill. TENEX, however, no longer carries this program.

Since there are many of us out here still using our trusty C-64s, and almost as many needing a program such as this, ►

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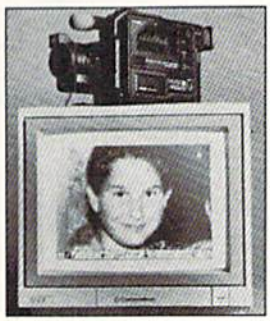

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I hope you can lead us to another source for this program or a similar product. Any help will be appreciated by many! (Well, at least by two!)

—Sharon Jayska
Farmington Hills, MI

Well, you're right. TENEX sold out of the DiskWill programs and we don't know where else to get them. However, Progressive Peripherals has a program called MicroLawyer. At the risk of repeating our past error, the only distributor of this program right now is TENEX. (At least, that's all we can find.) The program is different from DiskWill, but it should provide what you need. It is essentially a collection of templates for legal documents. There are over 100 documents, one of which is a will. However, this is not a standalone program. It must be used with a word processor. Any word processor that can read sequential files will work.

—Editors

RUN Support

I'm shocked that Galen Sitler (March/April Mail RUN) would request that you publish a PC *RUN* for the MS-DOS crowd. Doesn't he know that there's no shortage of PC magazines out there?

The other day, a friend of mine who owns a PC XT was watching me do some word processing with Spinnaker's The Writer program. He was surprised at the ease of use, the pull-down menus, the help screens, the spell checker and the slew of other features the program boasted. All done on my little 64. He told me, "I could've saved money and bought a Commodore. It does everything my computer does."

Please keep *RUN* for us dedicated 64 users. One suggestion: I'd like to see an article or two on desktop publishing on the 64/128.

—Kelvin Wade
Fairfield, CA

How about three desktop publishing articles? We published them in the July/August 1991 issue of RUN.

—Editors

Put Software on Cartridge!

We've heard it all before! "The 64 can't survive." It doesn't have enough memory, and the 1541 is "way too slow!" While it is true that the 64 has limitations, I believe that they can be overcome by innovative software developers.

On page 6 of the May/June *RUN* is a full-page advertisement for a game called Wrath of the Demon by Ready-Soft, Inc. This game is on a two megabit cartridge for the Commodore 64. No need to worry about having only 64K of memory. No need to worry about the speed of the disk drive, because loads are virtually instantaneous.

Think of it! Why not a good quality word processor with spelling checker, thesaurus, multiple fonts, mini-graphics and printer drivers all on a cartridge. No more swapping disks or waiting the minutes it takes with a disk-based spell-checker.

Databases, spreadsheets and desktop publishers could also be cartridge-based, with turbo-disk routines used to load and save the document for permanent storage. How about the entire GEOS system on a cartridge?

For the game player, how about an entire Ultima or other AD&D game on a cartridge instead of three or four disks. More levels, more graphics and no lengthy disk-access time.

Come on you software developers, let's get with it!

Just one more thought. For those people who want to upgrade to a PC compatible, you had better think it over. Just how long will that new PC be compatible with any of the latest software?

The 8088 processor is already considered sluggish and outdated. The 286 machines are said to be "not powerful

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enough for today's sophisticated software applications." Some people actually consider a 386 machine to be "today's entry-level system."

Advertisements for the newest PC software which use extensive graphics, such as Windows and the latest games, already require a 286 or 386 with VGA graphics, at least 640K of memory, add-on sound boards and a hard disk to be fully appreciated by the user.

Where will it ever end? How long will that new $1000 (or more) system last before it becomes "old technology." Does the average home computer user really need all this power?

If you write trilogies or run a good-sized business, then do yourself a favor and shell out the big bucks for a powerful PC. For me, a cartridge-based Word Writer would do just fine.

—Ron Hoffman
Dunkirk, NY

It's a Miracle

Commodore has received a lot of negative publicity for the shoddy treatment of its C-64 and C-128 customers. I want to share a recent experience I had with Commodore. I bought Commodore's "An Introduction to BASIC: Part I" and "An Introduction to BASIC: Part II" in 1983. These programming lessons are contained in books and cassettes. After sitting dormant for many years, I pulled them out of my archive to brush up on Basic programming. Unfortunately, I could not get any of the four cassettes to load on my VIC-20 or my C-64. I know my Datasette wasn't the problem—I had several other cassettes that loaded without incident.

I wrote to Commodore explaining my problem and that I would like to get the cassettes transferred to disk. About 10 days later, I received a package from their customer relations department. Not only did they explain the likely problem with my cassettes, but they sent me a whole replacement package including disks and books. Was I ever pleasantly surprised!

Here's the moral of the story: Before you write off Commodore as an uncaring, insensitive company, give them another chance. They certainly went beyond the call of duty when helping me.

—Mark Murphy
San Leandro, CA

Wow! Who knows, maybe CBM is turning over a new leaf. Their Commodore Express support line (800-448-9987) has certainly earned them some applause.

—Editors ■

Address Change

The Commodore Computer User's Group of Iowa has changed its address. The new listing is:

C.C.U.G.I.
PO Box 3140
Des Moines, IA 50316

Postage Due

I am very disappointed in your user's group listing, because you did not mention that readers requesting information should include a business-size self-addressed, stamped envelope, or at least a stamp and a return label. User's groups as a rule do not have a lot of money to spare, and we especially are in this situation, since we are a free club.

—John Calhoun, President
C-128 West User's Group
Covina, CA

Be sure to watch for more user's group information in future issues of Mail RUN

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SOFTWARE GALLERY

This issue's high-scoring assortment of games and productivity software easily makes the honor roll.

By WALT LATOCHA

STAR CONTROL.....A+

Multi-Faceted & Challenging Intergalactic Warfare

A mighty warrior's fist grasping a cluster of shimmering suns dominates the Star Control's box. The powerful symbol evokes images of blazing battles

Star Control's sound, graphics and control system make it an outstanding experience.

in outer space, and this new Accolade program delivers the power and excitement that the artwork promises, and does much more as well.

The software has a one-player mode, in which you take on the computer using either a joystick or the keyboard. Two human players can also compete against one another, with each using one of these input devices, or you can watch the C-64 play against itself.

The setting is the 27th century. Earth has recently joined the Alliance of Free Stars, and mankind must now join with its new allies in a battle for survival. The mighty enemy who must be stopped at any cost is the Ur-Quan Hierarchy, an evil empire of interstellar slavers.

You can choose to take either side in this conflict, and there are four different types of spaceships for each of the adversaries. The Alliance, for example, has vessels called Chenjesu Broodhomes, which fire crystalline weapons, while the Hierarchy uses acid-shooting Androsynth Guardians. Each ship has its own particular strengths and weaknesses.

There are three basic ways to play Star Control. The first is Practice mode, in which you match any Alliance vessel against any Hierarchy vessel in one-on-one combat. Melee mode gives each side a four-vessel fleet, then players take turns selecting a ship with which to fight.

The third and most complex is Full Game mode, which is then divided into rounds. In each, you can develop resources, build colonies, purchase ships, fortify stars and plot moves through space; meanwhile, your opponent is carrying out different plans for interplanetary conquest.

The program also includes a multitude of other options. For instance, the computer can either make the strategic choices or fight all the battles for the side you control. Also, in-progress Full Games can be saved to disk, and you can select one of three skill levels for the computer.

Star Control's sound and graphics are first-rate, and the control system, which is largely menu-driven, couldn't be better. Trying out different ships against one another with the computer set at varying skill levels is great fun, and the exciting head-to-head competition and rich strategic challenge the Full Game offers are entertainment bonuses.

The MS-DOS version of Star Control won many awards, and owners of the Commodore 64 version will quickly discover that the praise is well-deserved. This program offers a truly outstanding gaming experience. *(Accolade, 550 S. Winchester Blvd., San Jose, CA 95128. C-64/$39.95)*

SOFTWARE REPORT CARD

Outstanding	**A**
Good	**B**
Average	**C**
Below Average	**D**
Crummy	**F**

DEATH KNIGHTS OF KRYNN..A+

Heroic Combat and Awesome Magic in a Role-Playing Epic

It's not so much that SSI produces so many role-playing games or that they're so large. No, the truly amazing accomplishment of this prolific software pub-

A HUGE DEATH DRAGON, FLANKED BY
NIGHTMARES, SWEEPS TOWARD THE SUDDENLY
SILENT CELEBRATION. YOU NOTE SOMETHING
FAMILIAR ABOUT THE DECHENTO LEADER
ATOP THE DRAGON.
PRESS BUTTON OR RETURN TO CONTINUE

Death Knights is one of the rare sequels that surpasses its awesome predecessor.

lisher is the consistently high quality of its products.

Consider, for example, Death Knights of Krynn. It's the recently released sequel to the highly praised Champions of Krynn, in which the aurak Myrtani plotted to transform stolen dragon eggs into a huge army of evil draconians. This odious plan came to an abrupt end when a small band of warriors slipped into Myrtani's stronghold and slew the foul creature.

The new game begins just one year later. The heroes have gathered for an anniversary celebration and expect only a joyful reunion. Little do they suspect that Lord Soth, leader of the unholy death knights, is about to launch an even more vile scheme to enslave all of Krynn.

This new DragonLance game has the same basic structure as its predecessor, with some improvements. Now you can create player characters selected from seven races—including kender and half-elves—and choose for them one or more of six classes, such as paladins and the noble Solamnic Knights.

Each character has six randomly gen- ►

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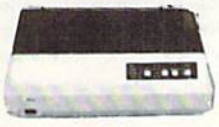

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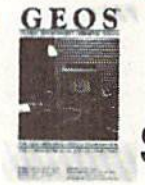

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erated ability scores and one of six alignments, plus constantly changing levels, hit points and experience points. You also have the option of directly importing Champion of Krynn characters, with any money and objects they may have accumulated.

The program's magic system includes three orders of mages, all of which are influenced by the moon phases on Krynn, and deities that bestow bonuses upon certain favored clerics. There are also supernatural treasures to be found, as well as 90 different spells to cast, including mass invisibility and the bizarre Otto's Irresistible Dance.

As in the Champions program, combat is the main focus of Death Knights, and 40 different creatures are eager to test your mettle. Among the more exotic monsters you may face in battle are whisper spiders, rhino beetles and zombie mastodons.

SSI needed six disk sides to hold all of these game elements, some fine sound effects and great graphics, which include spot animation and three-dimensional scenes. The menu-driven control system is a true delight to use, and the beautifully produced documentation quickly immerses you once again in the fascinating DragonLance mythos.

Death Knights of Krynn is that rare sequel that ends up surpassing its hit predecessor. This new program will make role-players eager for still more epics set in SSI's rich fantasy worlds. *(Strategic Simulations, Inc.; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$49.95. A clue book is also available for $12.95.)*

SUPER MARIO BROS. PRINT WORLD.....B

The "Big N" Goes Commodore

To paraphrase the popular advertising campaign: Nintendo knows games—but Nintendo don't know diddley about other computer applications. That's why Hi Tech's Super Mario Bros. Print World, which features the cartridge company's most well-known characters, is appearing on the versatile C-64 and not on the much more limited Nintendo Entertainment System.

The program contains 60 graphics. Approximately half feature Mario, his brother Luigi, and Princess Toadstool and her mushroom retainers, all in various poses and settings. The remaining pictures are of nasty Koopas and other villains whom the famous brothers battle in their video games, television shows and in their forthcoming feature-length movie.

This menu-driven program also includes 20 different borders, and it can produce signs, stationery, banners, storybook pages, masks, puppets and three styles of one- or two-sided greeting cards. You determine where the graphics and borders appear on the printed document, as well as the size of the images.

Super Mario Bros. will merge text with its pictures, too. You can choose any of seven fonts, seven text styles and three to eleven text sizes for cards, signs, stationery and banners. Left justification, text masking and other editing features are also available.

As with similar programs that Hi Tech has produced, this software lacks a preview screen that shows your pictures before printing. Instead, rectangles containing blocks and lines give a rough idea of the layout of the finished product. Also note that a great deal of careful reading and study is needed to successfully operate this software.

On the other hand, Super Mario Bros. Print World does provide an amazing number of features for a very low price and can serve as an excellent introduction to desktop publishing. And this software is more attractive than many of its predecessors, due to the characters it depicts. No matter what your opinion of Nintendo may be, you'll have to admit that Mario and company have far exceeded their video-game origins to become true multimedia celebrities. *(Hi Tech Expressions, 584 Broadway, New York, NY 10012. C-64/$14.95)*

NIGHTBREED.....B–

Supernatural Adventure in a Subterranean World

A number of popular comedy and adventure movies have been translated successfully into computer games. Now Ocean Software attempts the more formidable task of transforming a relatively little-known Clive Barker horror film into a best-selling C-64 program with their new release, Nightbreed.

Your goal is to guide Boone to Midian, where he hopes to find redemption. Hindering his quest are the Sons of the Free, an evil group of vigilantes who seek to ►

MAIL LIST MANAGER .....B+

A Postal Productivity Program

It's an axiom among computer users that thorough documentation should accompany powerful programs. Unfortunately, the instruction manual for Keystone's Mail List Manager is too brief, marring what is otherwise an exceptional software package.

The program comes on a non-copy-protected disk in two modes, one for the C-64, with a maximum of 300 records per file, and another for the C-128. The latter displays either 40 or 80 columns and can support files containing up to 1000 records.

The program's input screen includes nine fields—one each for the first and the last names, two for the address, one each for the zip code and city/state, and three for miscellaneous information. After data is entered, the resulting records can be sorted, deleted, edited and selected for printing. There's also a search feature, with "wild card" options, that can quickly locate individual records.

With Mail List Manager's file utilities you can import, export and delete groups of records, in addition to saving, loading and erasing entire files. The program also provides disk commands that include calling up directories and formatting new disks.

The manufacturer has programmed a number of printing options into the software. You can, for example, customize your output for certain printer models. Also, the disk contains a dozen label and card formats, and more can be added by using version 2.0 or 2.1 of Keystone's Label Maker program.

In addition to all of its other capabilities, this software has a most impressive menu-driven control system and its functions are executed at an amazingly fast speed.

Many of the features of the program are covered in the 16-page manual, but some are not. For instance, the documentation offers no descriptions of the individual label and card formats that come on the disk. You'll have to experiment to discover all that the software is able to do.

Mail List Manager can offer a huge productivity boost if you're willing to work at learning it. The program not only can serve as a powerful tool for creating and printing labels, it can also satisfy many other database needs as well. *(Keystone Software, PO Box 8369, Pittsburgh, PA 15218. C-64 and C-128/ $29.95)*

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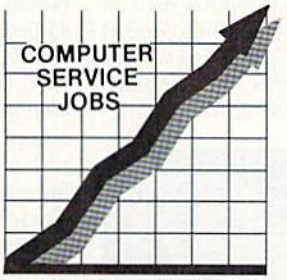

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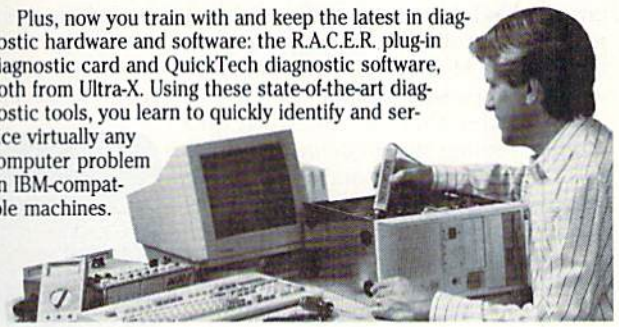

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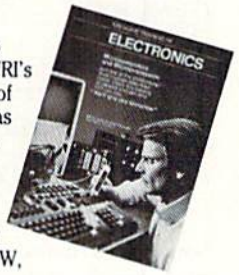

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destroy Boone and the Nightbreed with flamethrowers, rocket launchers, and other weapons. Other menaces include Decker, the real villain behind the mass murders, and hazards such as falling rocks and time bombs. In addition, there are the Nightbreed themselves, whose touch can be deadly. Among them are the Eyeball Monster and the Fatman, who vomits poisonous fluid.

Those who abhor occult stories in modern settings should definitely avoid this program, which contains many references to pagan magic. Seekers of blood-curdling thrills should also look elsewhere, because the software doesn't create nearly as much horror as the movie does. Shortcomings in the program include an annoying screen flicker that appears when certain game segments are loaded and a control system that takes some time to get used to.

What Nightbreed *does* do is deliver an unusual and challenging arcade experience. The many exotic areas you must explore and the bizarre foes you must face are both varied and challenging. And your adventures are supported by both a very welcome password option and some extremely unique and colorful graphics.

So, if pulse-pounding terror is what you desire, I recommend that you wait for Mr. Barker's next movie. But if fast action with a supernatural flavor is what you're after, then Nightbreed may just be right down your alley. *(Ocean Software Ltd.; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$29.95)*

METAL GEAR.....A–

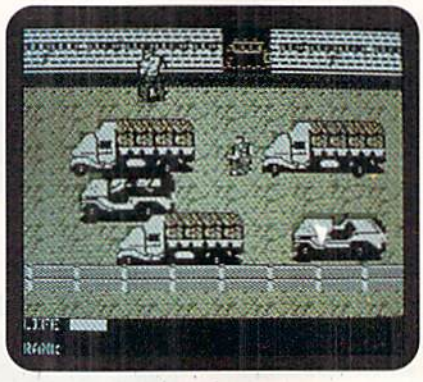
Your Assignment: A Commando Mission to Save the World

Beginning in the late 1980s, the boundaries that separate different types of electronic games began to blur. A recent example of this continuing phenomenon is the release for the C-64 of Metal Gear, a hit on the Nintendo Entertainment System. For players who don't care where a good game originated, this should be a reason for celebration.

The software's title refers to a super weapon that was created by Colonel Vermon CaTaffy (get it?), the terrorist ruler of a remote nation. As a commando with the code name "Solid Snake," you must penetrate CaTaffy's five strongholds and ultimately eliminate his doomsday device.

Of course, the vile Colonel has ordered his evil minions to stop you. They include hordes of crack combat troops, vicious attack dogs and killer scorpions.

Supporting your mission are a large paper map and transceiver messages that Snake's superiors send continuously. Also, you can pick up weapons such as grenade launchers and remote control missiles as the game progresses. And more than a dozen items of equipment are available, among the more exotic be-



Metal Gear by Konami offers intriguing mental challenge as well as action.

ing an antidote that saves you from scorpion bites and infrared goggles that let you see invisible alarm sensors.

Among Metal Gear's most attractive features are its tactical elements. Having to figure out what particular item is needed to extricate Snake from a hazardous situation adds some intriguing mental challenge to the exciting action. Fortunately, game positions can be saved to disk, allowing you freedom to experiment.

Although it can be quite difficult to play and has minimal sound effects, the game includes appealing graphics and even better background music. The control system nicely supports the gameplay, and the low price makes the software even more enticing.

It would be a shame if C-64 owners passed up Metal Gear just because of its "shadowy past." Even though it comes from the world of Nintendo, this program has a great deal to offer Commodore gameplayers. *(Ultra Software Corporation, a subsidiary of Konami Inc., 900 Deerfield Parkway, Buffalo Grove, IL 60089-4510. C-64/$14.95)*

NIGHT SHIFT.....B

Keep Them Dollies Movin'!

Ever since Maniac Mansion and Zak McKracken appeared, Lucasfilm Games has been known for entertainment software that's both well-done and a bit out of the ordinary. Night Shift, the publisher's latest C-64 release, adds still more evidence that this reputation is richly deserved.

As the game begins, you choose to become either Fred or Fiona Fixit, laborers at the Industrial Might & Logic (IML) factory. This facility makes Baby Vaders, Little Luke Skywalkers and other dolls.

Your work at the plant definitely is not easy. For one thing, the main guide to your job duties is an outdated and incomplete manual, which was printed with a defective typewriter. Also hindering your production are pests such as obnoxious lawyers and clinging, love-starved lemmings.

And then there's Bingham's Environmentally Active Solution for Toys, the brainchild of IML's founder. This machine, which is unaffectionately known as the BEAST, manufactures the dolls using power you provide with a bicycle-powered generator. As would be expected of a gargantuan Rube Goldberg device that's pieced together from used parts, the BEAST is prone to breakdowns, which you must quickly fix to keep production up. You begin with access to only a small segment of the machine, but are forced to tinker with more and more of it as you advance through the program's 30 levels.

The primary aid in your work is a joystick-activated toolbox, which contains not only ordinary wrenches, but also more exotic items such as Venus traps for capturing lemmings and helium balloons that speedily lift you to the top of the BEAST.

You'll probably enjoy Night Shift's tests of both your wits and your reflexes as you troubleshoot the BEAST's many problems. The program also has great graphics, sound and animation, and it includes a commendable password feature, which lets you skip levels that you've previously mastered.

On the negative side, the game is difficult to play, especially in its earlier stages. In addition, you may find the subject matter unappealing; after all, a simulation of an unprestigious job in which there are constant breakdowns can be just too much like real life.

Nevertheless, the software's humor, originality and pleasing mixture of arcade and tactical elements should draw an appreciative audience. If you love an excellently crafted program, no matter what its theme, you'll relish Night Shift. *(Lucasfilm Games; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$29.95)* ■

Walt Latocha, one of RUN*'s contributing editors, has extensive experience testing and reviewing software.*

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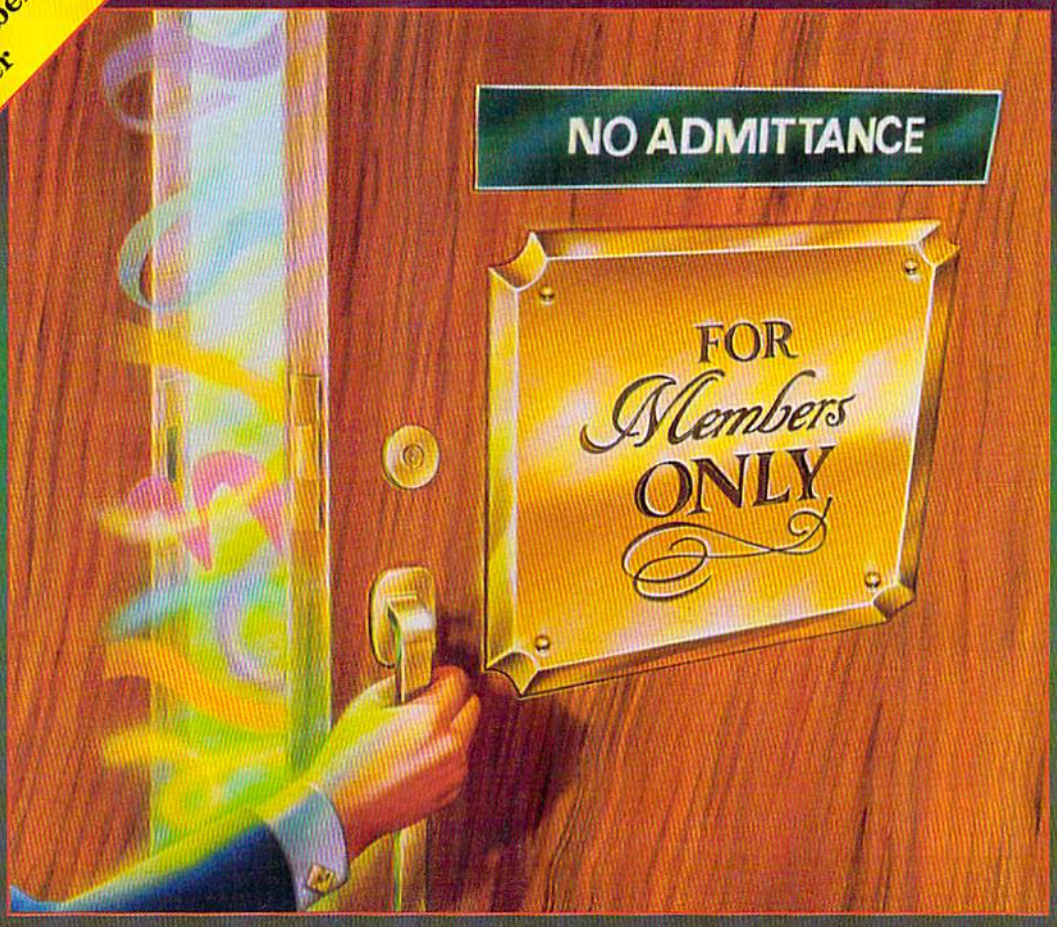

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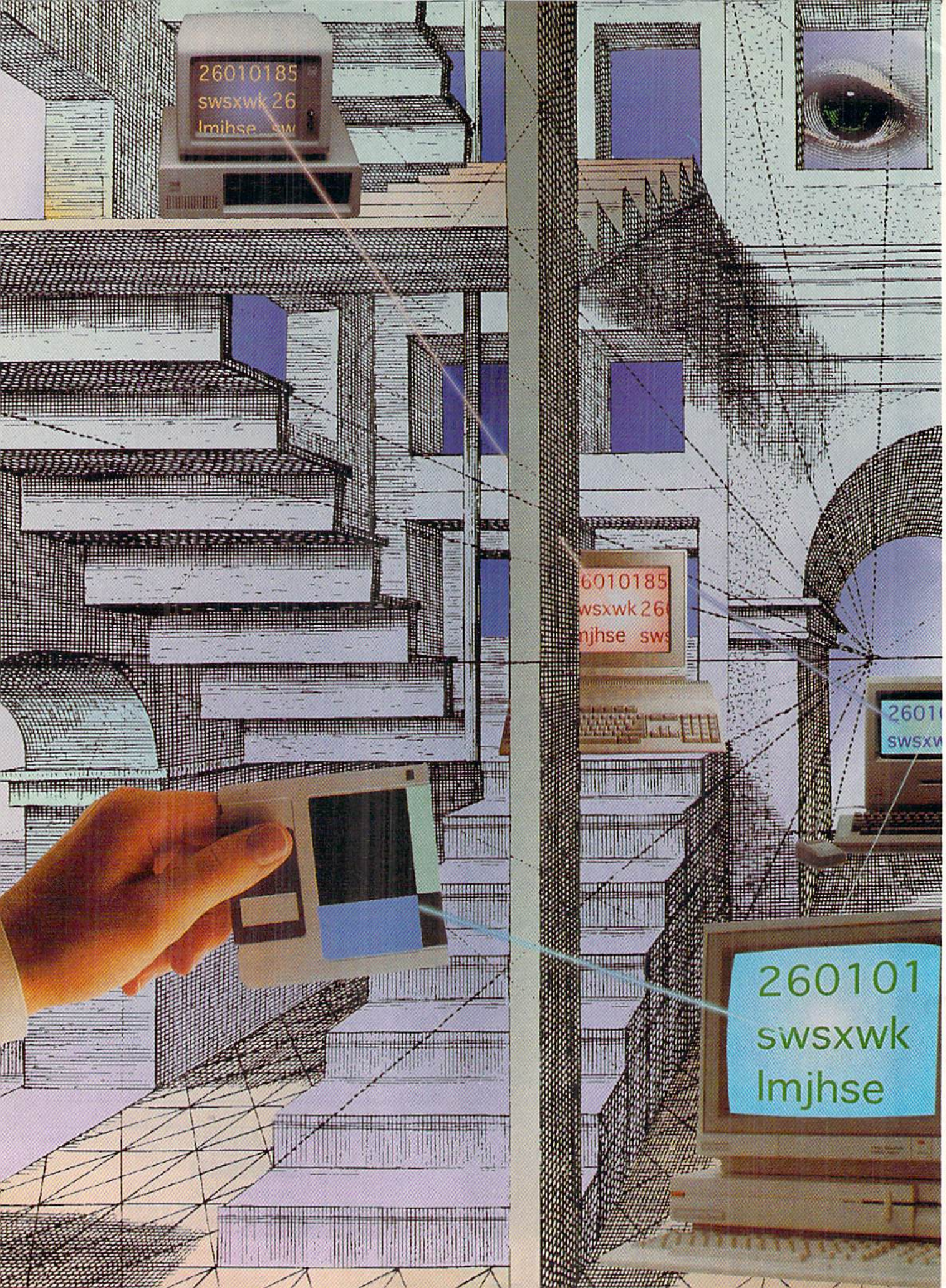
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Share and Share Alike

When it comes to swapping files with MS-DOS machines, Amigas and Macs, the C-64 and C-128 need only a little coaxing.

Visitors to my office often comment about what they see and hear. All the available desk and table space, and then some, is crowded (or is it *cluttered*?) with my collection of computers and stacks of peripherals. You name it: a Commodore 128, Amigas, MS-DOS machines, transient laptops—they're all there, lined up, with their disk drives and cooling fans humming away in a hi-tech chorus.

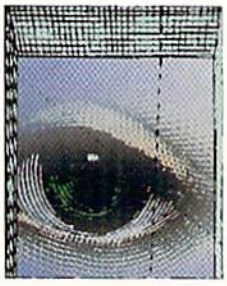
Despite the diversity of these machines, I think nothing of sharing files among them. Whether we're talking text files created with word processors or datafiles created with databases, I've learned ways to move files between systems with ease. Other users may tell you that Commodores are hostile to sharing files with other machines, but that's not true. In this article I'll describe how to do file conversions, and as an example, I'll explain the steps we follow in preparing an article for *RUN*.

It's important to note that no matter how easy the transfer process can become with a little practice, the various platforms, including the C-64/128, are not truly compatible with other systems. In particular, PC-compatibility with the C-64/128 is a myth. Yes, with the proper hardware and software you can ►

By TIM WALSH

ILLUSTRATED BY MARC YANKUS

share text and database files between Commodore and MS-DOS machines, but you can't share executable programs such as applications and games. The two systems use completely different hardware and software.



Hardware and Software

The most common type of file transfer needed by *RUN* readers is between Commodore and MS-DOS machines. Regardless of which direction you move the files, you must have at least one specialized conversion or telecommunications program and either a Commodore 1571 disk drive (the one that's built into the C-128D) or a Commodore 1581 3½-inch drive. If you have only a 1541 or the equivalent, you must make telecommunications or null-modem transfers, because the 1541 lacks the circuitry needed for MS-DOS compatibility.

To use telecommunications to transfer files between computers, the minimum additional hardware is a modem for each machine. On the software side, a telecommunications program is required for both the sending and receiving computers. I'll detail the use of modems in the conversion process later in this article.

To convert files for MS-DOS readability without telecommunications, a 1571 or 1581 is the only required hardware. Note that if you're using a C-64, or your C-128 in C-64 mode, the 1571 must be set to 1571 mode, using the following command:

```
OPEN 15,8,15,"U0>M1":CLOSE15
```

Various programs are available for converting text

Converting Graphics Files

By PAUL HUGHES

THERE ARE VARIOUS reasons why you might export C-64 graphics for use on other computers.

Perhaps you want to share your graphics with non-Commodore users, or use the C-64 as a low-cost graphics workstation at home and then transfer the results to the Macintosh or MS-DOS machine at work. Maybe you're upgrading your graphics capabilities to the Amiga and don't want to leave your collection of pictures behind, or you want to use more powerful desktop publishing software and paint programs that offer you higher resolution and more colors.

Whatever your needs and wishes, the following information will help you with the ins and outs of transferring graphics files between Commodore and non-Commodore computers.

Direct Versus Cross Conversion

To gain a clear understanding of the graphics transfer and conversion process, it's helpful to distinguish between what I call *direct conversion* and *cross conversion*. An example of direct conversion would be using MacAttack II by Joe Buckley to convert a geoPaint image to MacPaint, the Macintosh's native format.

A cross conversion involves converting an image from one format to a second intermediate one and then saving it in a third, final format. An example of this would be converting a geoPaint image to MacPaint and then using Scott Evernden's MacView program on the Amiga to read and save it as an Amiga IFF (interleaved file format) file. Another example would be using Jim Collette's GeoPCX program to save a geoPaint graphics image in color or black-and-white IBM PCX (PC Paintbrush) format, then use an Amiga public domain program, such as PCXTOIFF, to read and save the PCX file as an Amiga IFF file.

It would be simpler and more direct to transfer a geoPaint image in SEQ format with Convert 2.5 and then use Art Dahm's GeoView on the Amiga to load, view, print and then save it as a IFF file. The disadvantage of using GeoView over PCXTOIFF, however, is that GeoView saves the geoPaint image only in black-and-white Amiga IFF format; it strips the color information. A cross conversion might require an additional step, but the benefits outweigh the extra time involved.

Preparing a C-64 File

Before exporting your graphics images to other computers you may convert them to any of the following standard types:

- Images smaller than the screen (as with Print Shop, PrintMaster and Newsroom photos and banners)
- Full-screen images, including Koala (160 × 200-pixel multicolor), Doodle! (320 × 200-pixel hi-res color), RUN Paint (hi-res and multicolor), and standard black-and-white bitmaps
- Images larger than the screen, such as geoPaint's 640 × 720-pixel virtual full-page images

The popular formats on Quantum-Link and other networks are GG-prefixed Koala and JJ-prefixed Doodle!. These compressed formats save both downloading time and disk space. To get your graphics files into such a format, use one of the following programs.

For images created by any of the popular paint programs, use **Autograph** by David DeSimone (Fuzzy Fox on Q-Link). It is an all-in-one display, conversion and slideshow program that supports multifile selection, two drives, 1581 subdirectories and REUs. It also lets you rename and convert Koala images to RUN Paint multicolor format; this is necessary when converting Koala images to other computers, since the reverse-spade graphic character in the filename will be invisible to the other machine.

If you're using any of the venerable C-64 graphics programs, prepare your files with **Pixelmaster** by Steve Emsley. It can translate between 40 Commodore graphics formats, and lets you save images in standard Koala multicolor or Doodle! hi-res color format. Pixelmaster also processes and manipulates images.

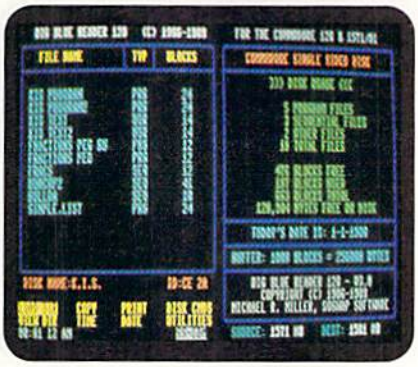
Fun Graphics Machine 6.0, by Ron Hackley, is a hi-res graphics manipulation and printing program that handles Print Shop Side A and B, PrintMaster and Newsroom photos, hi-res screens and Doodle! files. You can then save the composited image in a standard format for conversion to other platforms. A demo version on Q-Link (FGM V6 DEMO.SDA by RonH8) does everything but print.

Transfer and Translation

Some conversion programs are one-way only—they can convert from one format to another, but not back again. Others convert both ways. Among the

and formatting MS-DOS disks on Commodore 8-bit computers. Among them are **The Big Blue Reader**, from SOGWAP Software, and Miklos Garamszghy's **The MS-DOS Connection**, which *RUN* published in three parts in April, May and June of 1989. (It also appeared in two parts on the March/April and May/June 1989 ReRUN disks.)

For routine file conversions to or from Commodore format, the must-have program is The Big Blue Reader. It supports both the



The Big Blue Reader is a must-have.

1571 and 1581, works with one or more drives and is available in both C-64 and 128 versions. It can easily copy any number of files or an entire disk.

Be sure not to overlook freely distributed programs in your quest for conversion software. The GEnie and QuantumLink online networks are both good sources for them. QuantumLink offers quite a few conversion programs. In the Commodore Software Showcase area you'll find **Lharc128.arc**, a comple- ►

programs that convert C-64 graphics to other formats, some run on the C-64 and some run on other computers but can directly read Commodore graphic formats.

Another way to break down the conversion process is by what computer type you'll ultimately use the image on. Standard image formats you may want to convert to include Amiga IFF, MacPaint, PCX and GIF (graphic interchange format).

Macpaint and GIF are transportable between all formats. MacPaint is the standard for black-and-white virtual full-page images (576 × 720-pixel) that are readable by conversion programs on C-64s, C-128s, GEOS, Amigas, MS-DOS machines and Macintoshes.

GIF is a color-graphic standard designed by CompuServe for converting graphics images. Many GIF files have a higher resolution and more colors than can be displayed on the C-64.

GIFVERT by Randy Weems (GIFVERT. SDA by RandyW18 on Q-Link) will convert a 160 × 200-pixel GG compressed Koala into a 16-color GIF encoded file that can then be displayed and converted with any GIF viewer on another computer.

VGIF64V2.1, by DaveB on Q-Link, converts GIFs to Commodore Koala or Doodle! format.

GeoGIF1.2 (GEOGIF.SFX by Randy W18) will convert a nonhyphened interlaced GIF file to a monochrome geoPaint file using an advanced dithering technique.

Another black-and-white bitmap format, RLE (run length encoded) SEQ, was popular on CompuServe. **RLE/ DOODLE.SDA**, by WendelUrth on Q-Link, lets you easily load, view and print RLE and Doodle! files and save them in the opposite format.

Commodore and GEOS

Macto64-1525.sda and **Macto64-epsn.sda**, by Siamak Ansari (Siamak on Q-Link), both load, display and print MacPaint graphics on the C-64 and will also save the displayed screen section as a Doodle! file.

Grafix-Link from Solutions Unlimited, available through Briwall and packaged with Icon Factory, Billboard Maker and Screen FX, converts many hi-res monochrome formats to and from GEOS.

MacAttack II, by Joe Buckley, converts geoPaint graphics to or from MacPaint (640 binary and 512 nonbinary macpaint file header for transfer via modem or disk). It can be found on Q-Link as Attack2.SDA by Red Storm.

GeoPCX (geopcx.sfx, by GeoRep Jim —Jim Collette) will convert a color and black-and-white geoPaint image into a PCX file that can then be imported into geoWorks Ensemble geoDraw on an IBM PC. It offers full color and black-and-white mode support. The PC GEOS Palette option optimizes the colors for geoDraw. With this option off, the colors perfectly resemble the original C-64 colors. PC GEOS does not use the same color palette as the C-64, so not all 16 Commodore colors can be displayed properly on the PC.

Import Runner on *RUN*'s GEOS Power Pak I disk converts standard hires bitmap, standard and JJ compressed Doodle!, standard and compressed GG Koala (as grayscale shaded using four pattern sets), and RLE images into geoPaint images or Photo Albums, and MacPaint images into geoPaint files.

Graphicstorm, by Joe Buckley (uploaded on Q-Link by Fleximan), converts hi-res bitmap screens and colored Doodle! files to geoPaint format; it also converts Printshop Side A and B, PrintMaster and Newsroom photos into Photo Albums.

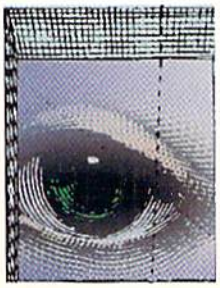
Paintview II, found on the GEOS Power Pak II, will display geoPaint images, and it can save a screen section as a colored Doodle! file.

PaintView II from GEOS Power Pak II can save screen sections as Doodle! files.

Amiga

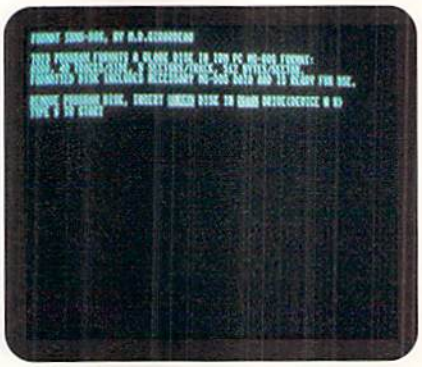
ConvDDL, **ConvertKOA**, **ConvPS** and **ConvNew**, by Brian Conrad, convert C-64 Doodle!, KoalaPaint, Print Shop (as brushes) and Newsroom photo and banner files, respectively, to Amiga IFF files.

GeoView, by Art Dahm, allows you to view, scroll around, print and convert geoPaint graphics that are in Com-



ment to The Big Blue Reader that lets you view and uncompress MS-DOS files that have been archived using the MS-DOS file-archiving utilities. It runs under the CS-DOS 1.5 operating system, also available through Q-Link. Another popular program from the Commodore Software Showcase area is **Format IBMS-DOS**, which formats MS-DOS disks on a 1571.

If you want to convert C-64/128 text files to Amiga format, there's only one software solution:



Format MS-DOS disks on your Commodore.

Transfer, an excellent program from ReadySoft, the Canadian company known for its Dragon's Lair game. This program, on an Amiga, will let you read in Commodore 8-bit text files and convert them, if necessary, to Amiga format.

Telecommunications

A good way to convert files from one format to another is through telecommunications, with a BBS (bulletin board system) substituting for a conver-

Converting Graphics Files (Continued)

modore SEQ Convert 2.5 format into Amiga IFF files (640 × 720 pixels). **GFCONV** converts the many geoFonts into Amiga fonts. **MacView**, by Scott Evernden, will open, save, print and convert between MacPaint and Amiga IFF files. **PCXTOIFF** converts PCX images to Amiga IFF files in color, virtual pages. This might be one way to convert color geoPaints to IFF format.

There are also various programs that will convert nine-block and Print Shop Companion fonts to Amiga fonts, and sprites into Amiga BOBs. Many of these programs can be found on the Fred Fish library of public domain disks and the GEnie telecommunications network. GEnie offers **64CONVERTERS.ARC**, **PSGFixed. ARC**, **CNVC64Font.ARC**, **SPRCON. ARC** and **CNVPSFont.ARC**.

Other programs will allow you to convert Atari ST and Apple hi-res screens to C-64 and Amiga IFF format (**STC64**, **STC64.M** and **STC64.DOC** by Syn error on Q-Link).

Q-Link's Amiga Alliance Interoperability library contains several programs for converting files between different computers. Of note are **PCX2IFF.LZH** by FEHudson, **MView.ARC** by Smaug User, **MultiView** by Scott Evernden (for viewing and converting Mac and Atari graphics to the Amiga), **MacView.ARC** by Aquaman1, and **64CONVERSION. ARC** by Don B.

GeoView.ARC, by Sysop PH, is a demo version that can only display and print geoPaint images, because the IFF Save option has been disabled.

Note that when you're converting a geoPaint image to MacPaint, about one inch will be cropped off the right side. Use the option to center or left-align the image when converting with MacAttack II.

While converting Koala and Doodle! images to the Amiga, the conversion program creates pure RGB color values that make the colors too vivid. To compensate, on the Amiga, use a color palette that more closely resembles the 16 subdued colors on the C-64.

MS-DOS

IConvert 1.50 is a CBM/IBM graphics conversion program that lets you view several formats as well as convert among them. It converts to and from the following formats: ASCII (8 × 8 and 8 × 14), BasicA BLoad (color and hi-res), Doodle! (CBM), Dr Halo II, First Publisher (Art and Mac), Fontasy (Block and Pic), GEM, GIF, IFF, NewsMaster, Newsroom, MacPaint, PC Paintbrush (Clip and Pic), PrintMaster (IBM and CBM), Print Shop (IBM and CBM), RLE, TIFF and Windows Paint. Options include ViewMode, for previewing graphics and marking files; Conversion, for unattended conversions and graphic manipulations; and File Maintenance. □

Paul Hughes is the graphics consultant for the QuantumLink Graphic Support Group and coeditor of geoWorld Magazine. *In his former role as Sysop PH, he contributed* ***GeoView.ARC*** *to the Q-Link libraries.*

Program Sources

Autograph
QuantumLink
8619 Westwood Center Drive
Vienna, VA 22180

Fun Graphics Machine
Ron C. Hackley
1185 Tierra Real Lane
Boulevard, CA 92005

GeoPCX
Comm-Plex Software
Jim Collette
6782 Junction Road
Pavilion, NY 14525-9755

GeoView and GFCONV
Art Dahm
40 Adams Ave.
Norwalk, CT 06851

Grafix-Link
Solutions Unlimited
Briwall
PO Box 129
Kutztown, PA 19530

IConvert 1.50
John Paul Michalski
Infinity Engineering Services
PO Box 812
Chandler, AZ 85244-0812

PixelMaster
Silvasoft
PO Box 1006
Charlotte, VT 05445

Storm Systems
Joseph Buckley
464 Beale St.
West Quincy, MA 02169

sion program. The only software you need is your terminal-emulation program. Upload a text file to a BBS with one computer and you can use a computer that's otherwise incompatible to download it. In most cases it'll be perfectly readable.

GEOS files are the exception. When a GEOS file is downloaded, it's usually in Commodore sequential form, which is unusable by GEOS. To cure this problem, the GEOS telecommunications program, **geoTerm II**, has a utility that converts files to and from GEOS format. On networks and larger BBSs, you'll also find utilities such as **Convert 2.5** that switch files from Commodore to GEOS format.

For greater speed than through a BBS, you can do a null-modem transfer. This procedure requires a null-modem-compatible terminal program in both the sending and receiving computers, and a null-modem cable running directly between the computers. Of course, this means that the machines must be close to each other, so the cable can reach.

A Working Example: *RUN*

Like many magazines today, *RUN* is desktop published with the aid of several computer platforms. Our articles and columns are written on C-64s or 128s, usually with the RUN Script word processor. When we receive the Commodore-formatted 5¼- or 3½-inch disks from our writers, the articles are edited, again with RUN Script, on a C-128. Next, the files are converted to MS-DOS format on 3½-inch disks using a 128 and Big Blue Reader. These files are then converted on a Macintosh to Mac format, using the Apple File Exchange software, then loaded into Microsoft Word for a second edit. Finally, the files are imported into Quark XPress for desktop publishing on the Mac, where the layout and final editing is done.

Why don't we stick to Commodore equipment from start to finish to desktop publish *RUN*? We would if we could, but the demands of professional publishing require that we use systems that have the hardware and software necessary to efficiently handle enormous files, various professional-quality fonts and high-resolution black-and-white and color graphics. Also, most printing companies today are set up to handle Macintosh-generated desktop publishing files.

We also receive articles each issue over our RUNning Board BBS and the online networks. These files are downloaded using a 128 or an Amiga and then edited in Commodore format before conversion to the Mac.

In the case of this article, I wrote the text on my C-128 using RUN Script 128. The RUN Script file was saved in sequential format to a 3½-inch disk in a Commodore 1581 drive, then converted using Transfer to an ASCII text file on an Amiga 2500. I analyzed and spell-checked it with an Amiga word processor, then saved it in MS-DOS format using an Amiga conversion program called CrossDOS, from Consultron. Finally, the file was converted from MS-DOS to Macintosh format using Apple File Exchange on the Mac and ended up in Quark XPress to be desktop published.

While this process may sound complex and intimidating, it's only a matter of following step-by-step procedures. And that applies to conversions you do, too.

Looming Limitations

Perhaps the most feared format among Commodore users is the high-density (1.44-megabyte) 3½-inch standard on MS-DOS 80286/386/486 machines. It's unreadable by the Commodore 1581 disk drive, so the only remedies are copying the files from the high-density disk to a low-density disk that's Commodore-readable or using telecommunications.

Converting graphics is very different than converting text. When graphics, bitmapped images and fonts enter the picture, special software (most of which is available through free-distribution channels) is needed. Not only does the disk format change, but other factors take on importance as well: coordinating the source and destination screen-display resolutions, the memory location of the bitmapped screen on the source computer, the models of the source and destination computers, the graphics packages used and so on. Graphics conversions are discussed in Paul Hughes' sidebar to this article.

Do What Works Best

Converting files to and from Commodore format is easy—that is, if you have the right tools. Given the wrong software or hardware, the job is impossible. The best advice I have to offer is: *Use what works best.*

For transferring text files, use a good transfer program, such as The Big Blue Reader. For converting graphics, use one of the appropriate programs listed in the sidebar. If you run into problems converting from MS-DOS to Commodore format, make sure the MS-DOS disk isn't high-density.

Finally, don't expect instant perfection from the transfer process! All too often during the process, as you *will certainly* find out, carriage returns disappear and/or line feeds or odd characters mysteriously creep in, so don't be surprised if you have some cleaning up to do.

Small problems notwithstanding, your Commodore can indeed share files with MS-DOS and other machines. Your trusty computer is not and will not be obsolete. With this file conversion capability, it and you are ready for the 21st century. ■

Tim Walsh is RUN*'s technical manager, telecommunications guru and file converter par excellence. Between phone calls, he writes a continuous stream of articles for* RUN *and* AmigaWorld *magazines.*

Three Essential Rules of Thumb

1. *Don't include special formatting commands in files* when converting them to other formats. They'll only add extraneous codes that have to be removed later. This rule also applies to attributes such as fonts, italics, bold, and the like.

2. *Remember to convert to True ASCII and from Commodore ASCII.* Many word processors, such as RUN Script, offer this option for convenience.

3. *Always use sequential files, not program files,* when converting text files from one format to another. Program files won't convert properly, if at all.

MultiCopy

This blockbuster program will support all your peripherals, format your disks, scratch and verify files . . . oh yeah, and copy them too!

By ROBERT ROCKEFELLER

MultiCopy makes it a breeze to duplicate Commodore files. It works with a C-64 or a 128 in 40- or 80-Column mode. It accommodates one, two or three disk drives, and provides 11 commands, including Copy, Verify, Scratch, Rename and Format. It also time- and date-stamps files.

Type in the program from Listing 1, and use *RUN*'s Checksum program on page 61 to catch any typing mistakes you might make. Once the program is typed in and saved, run it to create the file MultiCopy.

At the beginning of the MultiCopy program, you must enter the date in mm/dd/yy format: month, day and year. The month must be represented as a number from 01 to 12, the day from 01 to 31, and the year from 00 to 99 (each entry must be a two-digit number).

The program checks to see if the 24-hour clock has already been set in a previous MultiCopy session. If the clock isn't running, you must enter the time in hh:mm:ss format, which means hour, minute and second, respectively. As with the date, each entry must be made as a double digit, and remember that this is a 24-hour clock, so enter the hour accordingly. (The clock and the date are not linked, so the date doesn't change when the clock runs to midnight.)

The Main Screen

After you have entered the date and time information, the MultiCopy main screen appears, containing three boxes titled Current Devices, Commands, and Settings. A fourth box displays the time and date.

MultiCopy checks for disk devices each time it starts up, and automatically determines the type and device number of each one connected. The Current Devices box lists the disk devices connected and the device number associated with each. MultiCopy supports the 1541, 1571 and 1581 disk drives, and their compatibles, as well as the 1750 RAMdisk.

The Settings box lists the current program settings. FROM DEVICE indicates the device to load from when copying (or verifying) files. TO DEVICE indicates the device to copy files to. These can be changed with the Usage command. PROMPT can be turned on or off. When it's on, the program warns you before copying over any existing file. The program defaults to the off setting. You can change the setting with the Prompt command. (For details about this setting, see the Copy Files section below.)

The Commands box lists the available commands. Use the cursor keys to move the cursor up and down until it's positioned on the desired command, then press the RETURN key to execute. If you select a command and then change your mind, simply press the RUN-STOP key to abort.

The Commands

•**Copy Files**—Select this command to copy files from one disk to another, using either one or two disk devices. The files will be loaded from and written to the devices you selected in the Settings box on the main screen. If there are no files on the from disk, no directory will be displayed. If the from and to devices are the same, you must swap disks periodically.

When you're copying a file, a file with the same name could already exist on the destination disk. Unless PROMPT is on, the program will automatically scratch the old file, writing over it with the new one.

When you press RETURN to execute the Copy command, a box will appear listing all the files on the disk in the from device. With the cursor keys, position the cursor on a file you wish to copy, then press the space bar to tag the file with a checkmark. Select as many files as you need.

The BACK-ARROW key (in the upper-left corner of the keyboard) performs a special function. When it is pressed, any unmarked files become marked and any marked files become unmarked. Let's say you want to copy all the files on a disk except one. You can tag the one you don't want, then press the BACK-ARROW key to tag the ones you do.

Press RETURN to copy the checked files. During the load operation, the cursor will indicate which file is currently in transit. When the program has loaded as many files as it can, it writes them to the destination disk. If you're using only one drive, a prompt will tell you to insert the to disk. Just remove the from disk, insert the to disk and press RETURN.

This process of loading and writing files will continue until all tagged files have been copied. Then MultiCopy will read in the directory blocks of the to disk and stamp each file that was copied with the date and time.

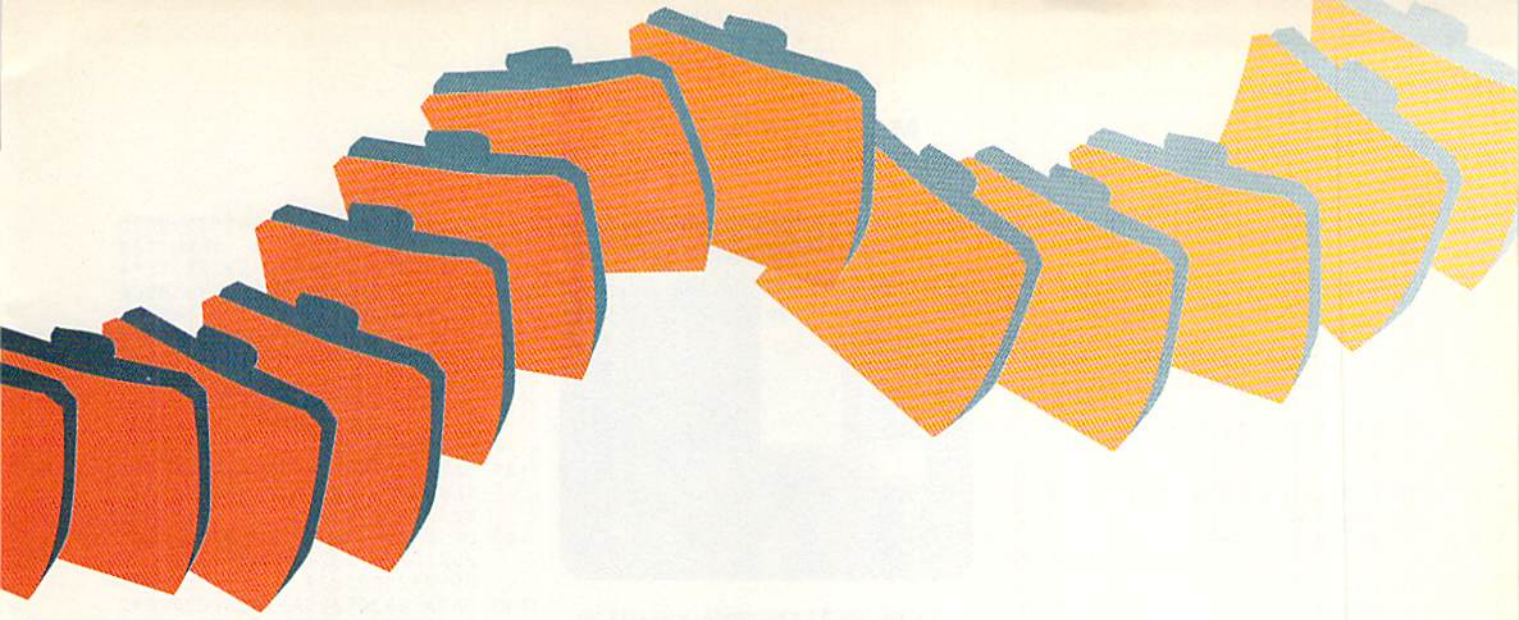
Because Commodore didn't make the 1750 RAMDOS software 100-percent compatible with Commodore floppy drives such as the 1541, it's impossible to copy a relative file from a RAMdisk to a floppy. Time- and date-stamping isn't possible with RAMdisks either.

•**Prompt On/Off**—Select this command to turn the prompt on or off. If you wish to be notified before files are scratched during copy operations, press Y. If you don't, press N and RETURN.

•**Verify Files**—Select this command to verify files on different disks. With two disk devices, files will be loaded from the from device and compared to a file in the to device. If you're using

RUN it right: **C-64 or C-128 (in 40- or 80-column mode); one, two or three disk drives**

ILLUSTRATED BY ANN DILLON



only one device, you have to swap disks before the comparison can take place.

Press RETURN and a box will appear listing all the files on the disk in the from device. Use the cursor keys to place the cursor on the file you wish to verify, then press the space bar or the RETURN key to select that file. A checkmark will appear beside the filename, and the file will be loaded into memory.

When the file has loaded, you will be asked to select the file on the destination disk to compare it to. If you're using one drive, a prompt will tell you to insert the to disk before verification can occur. Just swap the disks and press RETURN. If you're using two drives, no prompt will appear and the files will be compared automatically. If the files are identical, a message will appear saying FILES OK!. Otherwise the message will say FILES DON'T VERIFY!. In either case, press RETURN to revert to the main screen.

•**Scratch Files**—Select this command and enter the device number. A box will appear listing all the files in that device. Place the cursor on each file you wish to scratch, then press the space bar to tag the file. The BACK-ARROW key performs the same function here as with the Copy command.

•**Rename Files**—Select this command and enter the device number you wish to use, and a directory will appear. Select the file you wish to rename by cursoring to it and pressing the space bar. When a prompt asks RENAME FILE TO WHAT?, enter the new filename and press RETURN. After you've marked the files you want, press RETURN and they will be renamed.

•**Usage**—The Usage command lets you define the from and to devices for copy and verify operations. Files will be loaded from the from device and written to or compared with a file in the to device. Just enter the appropriate device numbers at the prompts as they appear.The from and to devices can be the same or different drives.

•**Format Disk**—To format a disk, at the first prompt, enter the device number and press RETURN. At the second prompt, enter the disk name and press RETURN. At the third prompt, enter the disk ID, which must be two characters long, and press RETURN. The disk will then be formatted.

•**Erase Disk**—The Erase command lets you scratch the contents of a disk. At the first prompt, enter the disk device number and press RETURN. At the second prompt, enter the new disk name and press RETURN. All the files on the disk will be scratched.

•**Poll Devices**—This command determines which disk devices are connected to the computer and displays them in the Current Devices box. MultiCopy can recognize up to three devices and automatically checks for them when starting up. The Poll Devices command is provided in case you turn on another disk device while the program is running. Note that you may have to issue a new Usage command after Poll Devices executes, because the latter automatically resets the from and to devices.

•**Compatible**—With this command you can define a third-party, non-Commodore disk drive as compatible with a 1541, 1571 or 1581. You must make sure that the drive is indeed compatible; for example, a 1581 isn't compatible with a 1541 or 1571. At the prompt asking DEFINE WHICH DEVICE AS COMPATIBLE?, enter the device number of the compatible drive and press RETURN. At the next prompt, asking COMPATIBLE WITH WHICH DRIVE?, enter the drive with which it's compatible—either a 1541 or 1571—then press RETURN.

You can copy a relative file only from a 1541, 1571 or 1581, although relative files can be written to other types of drives. Also, time- and date-stamping is possible only with Commodore floppy drives and their compatibles, because the directory track must be directly accessed for these functions.

•**Quit**—Select this command when you wish to stop using the program and return to Basic.

With MultiCopy you can copy files quickly and efficiently. All the commands you need are here, ready for you to put them to work. R

Robert Rockefeller, a Commodore programmer and enthusiast from Ontario, has written several popular programs for RUN, *including our RUN Script word processor.*

Listing 1. Multi-Copy program. (Also available on the September/October ReRUN disk. To order, call 800-343-0728.)

```
Ø REM THIS LIST 1 CREATES (AND
  SHOULD NOT BE CALLED) MULTI-C
  OPY                    :REM*175
5 OPEN 8,8,8,"MULTI-COPY,P,W"
                         :REM*35
6 CT=Ø:PRINT"{SHFT CLR}":REM*56
1Ø READ A$:IF A$="-1" THEN CLOS
  E8:PRINT:PRINT"ALL DONE!":EN
  D                      :REM*129
12 PRINT"{HOME}READING LINE "+S
  TR$(CT):CT=CT+1        :REM*141
15 IF LEN(A$)<62 THEN 55
                         :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
  2Ø)+MID$(A$,43,2Ø)     :REM*242
25 FOR I=1 TO 3Ø         :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                         :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55               :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A ►
```

RUN it right: **C-64 or C-128 (in 40- or 80-column mode); one, two or three disk drives**

```
   SC(L$)-55              :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*67
5Ø NEXT:GOTO 1Ø           :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
   O 7Ø                   :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
   A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
   )):GOTO 7Ø             :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
   Ø)+RIGHT$(A$,LEN(A$)-42)
                          :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                          :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55              :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55              :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*148
95 NEXT:GOTO 1Ø           :REM*16Ø
1ØØ REM HEX DATA FOR RUN COPY I
   I                      :REM*21Ø
1Ø1 DATA Ø11C191CØAØØ8BC22836*3
   535333229B2323236A7*9E323Ø3
   838ØØ261C14ØØ          :REM*48
1Ø2 DATA DE9C3A9E37323131ØØØØ*Ø
   ØB85ØØ34C511CA9ØØ85*478549A
   9258548A93985           :REM*234
1Ø3 DATA 4AAØØØA21EB1479149C8*D
   ØF9C648C64ACADØF24C*511CA9Ø
   E8DØØFFADFCFF           :REM*118
1Ø4 DATA C93DFØØ3A94Ø2CA98Ø85*Ø
   9A5F18D8139AD2ØDØ8D*7E39AD2
   1DØ8D7F39A21A           :REM*176
1Ø5 DATA 2Ø57348D8Ø39A9ØØ8555*2
   Ø9ØFF8D2ØDØ8D21DØA2*1A2Ø493
   42Ø9532Ø1E29            :REM*145
1Ø6 DATA 2Ø77282ØFC1D2ØC7322Ø*E
   21EA9ØE8DØØFFA2FB9A*2ØCCFFA
   9DE482ØC3FF68           :REM*211
1Ø7 DATA 1869Ø1C9E29ØF42Ø632A*Ø
   AA8B9C71C48B9C61C48*6ØAB2Ø8
   Ø23C7265Ø27A4           :REM*187
1Ø8 DATA 27231D4B1D931D1A1DC1*1
   F442ØF21CA9ØC2Ø482B*DØØ34C6
   1229ØF48529B5           :REM*65
1Ø9 DATA 22852A6Ø24Ø93ØØ36CFC*F
   FA9ØØ8DØØFFAD813985*F1AD7E3
   98D2ØDØAD7F39           :REM*1Ø6
11Ø DATA 8D21DØA21AAD8Ø392Ø49*3
   44CØØ4Ø2ØFC1D2ØE21E*4CA11CA
   51EFØ1EA9ØØ2Ø           :REM*9Ø
111 DATA 482BFØ179ØF78525B522*8
   527A9Ø32Ø482BFØØ89Ø*F78526B
   52285282ØE91E           :REM*234
112 DATA 4CA11C2Ø711D2Ø991D2Ø*5
   81D4C491DA6292ØØE1F*AØØØB95
   3392Ø141FC8CC           :REM*174
113 DATA 52399ØF42ØCCFF4C7Ø1F*A
   94E2ØC51D2ØEØ1CA9Ø6*2ØA92AF
   ØC9ACØØØ2C8C8           :REM*237
114 DATA 8C52398888B9ØØØ29954*3
   988DØF76Ø2Ø711DFØB9*A9Ø92ØA
   92ADØØ34C491D           :REM*2Ø
115 DATA ADØØØ2C9Ø2DØEFAC5239*A
   92C995339C8ADØ1Ø299*5339C8A
   DØ2Ø2995339C8           :REM*11
116 DATA 8C52396Ø8D5339A93A8D*5
   439A9Ø28D52396ØDØØ1*6Ø48A8A
   92Ø9914359915           :REM*91
117 DATA 35A9ØØ2Ø343468A8A2ØØ*A
   D9639C9Ø1FØØ42ØF51D*E8C8BD9
   7399914356ØA2           :REM*53
118 DATA ØBA9ØØ951ECA1ØFBA91F*8
   529C629A5292ØC3FFA5*29C9Ø8D
```

MultiCopy has 11 commands, supports up to three drives, and time and date stamps.

```
   ØF3A91485ØAA9           :REM*218
119 DATA 3585ØBAØ3EA92Ø91ØA88*1
   ØFBA9148D14358D2935*8D3E35A
   ØØFA5292ØFE1E           :REM*127
12Ø DATA A2CØAØ34A9Ø22ØBDFF2Ø*C
   ØFFBØ662Ø851FBØ61C9*49DØ5DA
   2ØØBD2939C92Ø           :REM*97
121 DATA FØØCC92CFØØ8C93Ø9ØØB*C
   93ABØØ7E8EØ289ØE8BØ*41AØØ4B
   D293991ØAC92C           :REM*1Ø5
122 DATA FØØEC9ØDFØØAE8EØ28BØ*Ø
   5CØ14C89ØE9A61EAØ12*B1ØAC93
   5FØØ52Ø4Ø2ØFØ          :REM*194
123 DATA Ø6C8B1ØA2Ø2C2ØA52995*1
   FA5ØA38691485ØA9ØØ2*E6ØBE61
   EDØØ5A5292ØC3           :REM*151
124 DATA FFA51EC9Ø3BØØBE629A5*2
   9C91FBØØ34C321EA522*8527852
   8A61F86258626            :REM*57
125 DATA A9Ø12ØD31DA916A62Ø2Ø*D
   31DA92BA6214CD31DA2*F4AØ342
   ØE632A625A974            :REM*224
126 DATA 2ØD61DA626A9832ØD61D*A
   264AØ354CE632A6292Ø*BAFF24Ø
   91ØØ6A9ØØAA4C           :REM*14
127 DATA 68FF6Ø2ØC9FFBØ196Ø2Ø*D
   2FFBØ136Ø2ØC6FFBØØD*6Ø2ØCFF
   FBØØ76Ø2ØCØFF           :REM*64
128 DATA BØØ16Ø48A9ØØ8DØØFF2Ø*B
   41F24Ø93ØØ6A29EAØA1*DØØ4A24
   BAØ48862C842D           :REM*77
129 DATA AØØØ68AACAFØ1Ø3ØØEB1*2
   CØ8E62CDØØ2E62D281Ø*F43ØEDB
   12CØ8297F9929           :REM*116
13Ø DATA 39C8281ØF42ØA51F4C7A*1
   F2Ø851FBØB7C914BØØ1*6ØA9ØF2
   ØA92A2ØC7324C           :REM*77
131 DATA A11CA6BA2ØC6FFBØ28AØ*F
   FC8CØ28BØ122ØCFFFBØ*1C99Ø1Ø
   29929398CØØØ2           :REM*5
132 DATA C9ØDDØE9981869ØØ8D28*3
   92ØCCFF2Ø8133186Ø48*2ØCCFF6
   8386Ø24Ø97ØØ2           :REM*56
133 DATA A5D76ØA93Ø2Ø482B9ØF9*D
   ØØ34CA11C865FA9332Ø*482BFØF
   4ADØØØ2C9Ø4DØ           :REM*139
134 DATA F2A931CDØ1Ø2DØEBCDØ4*Ø
   2DØE6ADØ2Ø2C935DØDF*ADØ3Ø2A
   65F2Ø2C2ØFØD5           :REM*144
135 DATA AØØØB9Ø1Ø2996Ø35C8CC*Ø
   ØØ29ØF4A9ØØCA3ØØ518*6915DØF
   8A8A2ØØC8BD53           :REM*2Ø4
136 DATA 35991735E8EØ119ØF4A2*2
   2AØ342ØE6324CA11CC9*37FØØCC
   934FØØ8C938DØ           :REM*234
137 DATA Ø8A94ØDØØ6A98ØDØØ2A9*Ø
   Ø95226ØA9ØC2Ø482B85*299ØF7D
   ØØ34CA11CA936           :REM*124
138 DATA 2ØA92ADØØ8A6292Ø871F*4
   C7A1FA2ØØBDØ1Ø29D53*39E8ECØ
   ØØ29ØF48E5239           :REM*2
139 DATA 4C521D782ØØAC34F5Ø59*2
   ØC6494C45534F46462Ø*4F4EAØØ
   1B134C9BADØØ1           :REM*64
14Ø DATA 6Ø2Ø992ØDØF2186ØA542*1
   869Ø385429ØØ2E643E6*392ØFE2
   EC63D6ØA9ØØA2           :REM*56
141 DATA 76AØ2Ø2Ø3724A2992Ø13*2
   4DØØ34C6122853D2Ø36*2E2Ø4F2
   F2ØFD322Ø892Ø           :REM*9
142 DATA BØØ34C61222Ø6C242Ø89*2
   Ø9Ø1B2ØB1232Ø7924Ø8*2Ø7D2E2
   Ø553328BØØB2Ø           :REM*1
143 DATA 992ØFØØ6A544C9FC9ØEØ*2
   Ø6C242ØØ324A544DØØ3*4C5Ø22A
   9ØØ8545A445B9           :REM*34
144 DATA EF3B8552B9FØ3B8553B9*F
   33B854DB9EB3B8549B9*EC3B854
   AAØØ3A2ØØB149           :REM*158
145 DATA C9AØFØØD9D55399DB137*9
   D7936E8C8DØED8E5239*A9229DB
   1379D7936E8A9           :REM*18Ø
146 DATA 3F9DB137A92Ø9D79368A*6
   9Ø98DA7378A69Ø98D6F*36A445B
   9F13BC952DØØ8           :REM*218
147 DATA B9F23BAAA94CDØØ2A257*A
   C52399956398A995839*A92C995
   539995739C8C8           :REM*138
148 DATA C8C88C5239AD5239A255*A
   Ø392ØBDFFA528852AA9*DFAØØ2A
   62686292ØFE1E           :REM*2Ø5
149 DATA 2Ø261F2Ø851F9ØØ34C2C*1
   FC9149Ø41C93FFØØ7C9*32FØØ34
   C7A1FA9DF2ØC3           :REM*2ØØ
15Ø DATA FF24551ØØEA92A2ØA92A*F
   Ø6EADØ1Ø2C959DØ67AD*523948A
   9532ØC51D6838           :REM*5Ø
151 DATA E9Ø28D52392Ø581DAD52*3
   91869Ø28D52394C8621*2ØC1232
   Ø832BA2Ø7B516           :REM*248
152 DATA 48CA1ØFAA265AØ362ØE6*3
   2A2ØØ689516E8EØØ89Ø*F8A445B
   9F13BC952DØØ3           :REM*153
153 DATA 4C6722A2DF2ØØE1F2Ø26*2
   72ØEC22Ø8AØØØB9EB3A*2Ø141FC
   8CCEA3ADØF428           :REM*7Ø
154 DATA 9ØE82ØCCFFA9DF2ØC3FF*2
   Ø8E2BA5451869Ø98545*C544BØØ
   34CØ621A53DFØ           :REM*69
155 DATA ØAA9ØØ85442ØF8234CD2*2
   Ø2ØB2292ØC7324CA11C*A9428DF
   423B9ED3B8DF5           :REM*1Ø6
156 DATA 23B9EE3B8DF6232Ø1426*A
   2DF2ØØE1FA9FF2Ø141F*2Ø2626A
   9Ø18DF523A9ØØ           :REM*138
157 DATA 8DF6232Ø14269ØØ34C7A*1
   FA2DF2ØØE1F2ØEC2266*57AØØØB
   9EB3AC8C9FFFØ           :REM*251
158 DATA ØF2Ø141FCCEA3ADØFØ24*5
   71ØE54C372224571Ø05*CCEA3AF
   ØF498482ØCCFF           :REM*23
159 DATA 2Ø2627EEF523DØØ3EEF6*2
   32Ø14269ØØ34C7A1FA2*DF2ØØE1
   F68A8CCEA3AFØ           :REM*1Ø6
16Ø DATA B5DØBA24Ø95Ø3CAØØØA2*Ø
   ØA553DØØ2A65278A93Ø*85Ø1B15
   Ø99EB3AC8CADØ           :REM*52
161 DATA F7A93785Ø1588CEA3A98*F
   ØØ7186550855Ø9ØØ2E6*5118A55
   3FØØ9C653DØØ6           :REM*2Ø8
162 DATA A552FØØ16Ø386ØA95Ø8D*A
   AØ2A553FØØ7C65318A2*ØØFØØ3A
   65238Ø8614AØ            :REM*172
163 DATA ØØ8CEA3AA64DAØØØ2Ø*Ø
```

MULTICOPY

```
      2ACEA3A99EB3AEEEA3A*E650D00
      2E651A551A64D          :REM*16
164 DATA E03FF006C9FE90126860*C
      9FE900CA97F854DA904*8551A90
      08550C614D0C8          :REM*173
165 DATA 2860A92D20A92AD0034C*A
      11CAD0102C959F005A9*00AAF00
      4A980A2038555          :REM*189
166 DATA A000BD832099A535C8E8*C
      00390F420E91E4CA11C*200A2F2
      4561003200FD32         :REM*209
167 DATA 207D2E4C5233A014A200*B
      DD20A9149C8E8E0089*F5203628
      A01DA200BDE3           :REM*11
168 DATA 389149C8E8E0059F560*E
      5230DC34F4D50415245*20C6494
      C45535048010           :REM*97
169 DATA 012E0E24D005A9154CA9*2
      A602E0E24D005A9184C*A92A60A
      525C5266A90F           :REM*58
170 DATA 202124A625A9E4A03F4C*8
      92C8DA5388EA738A93F*854DA00
      8B9A23899E43F          :REM*221
171 DATA 8810F76085418 61C841D*2
      0BB1F3003207C33A61C*A41D201
      B332 0BB1F1012         :REM*163
172 DATA A200A028182 F0FFA91B*2
      0D2FFA9544CD2FF60A9*68854FA
      9000854EA93F85         :REM*140
173 DATA 4DA54F8551A54E8550 60*A
      625A042A9DF38B007A6*26A043A
      9E018 08862985         :REM*233
174 DATA 2B8CF4232 FE1EA627A5*B
      AC526D002A628862AA4*44A54D9
      9F33B28A900AA          :REM*44
175 DATA 6A85541 3024097008A5*4
      DC93FD002A2FA8611A9*008512A
      9FEE5519000918         :REM*17
176 DATA 651185119002E612A000*A
      511D142C8A512F142B0*02386 A
      003A200B134C9          :REM*205
177 DATA A0F0079D5539E8C8D0F3*8
      E52398AA255A03920BD*FF20261
      F2070 FA9 0085         :REM*100
178 DATA 528553A023B134C952D0*0
      34C7725A62B201A1FA0*0020201
      F99EB3AC8F004          :REM*48
179 DATA 24905 F32004262 02627*2
      03426B03C24905 E224*54102AA
      644A5349DEB3B          :REM*252
180 DATA A5359DEC3BA5529DEF3B*A
      5539DF03BA023B1349D*F13BA00
      2B1429DF23B8A          :REM*51
181 DATA 1869 985442 CCFFA52B*2
      0C3FF186 249 7 C42 *6425386
      0A52AD023AD52          :REM*1
182 DATA 39AA1869128D8437A000*B
      95539999637C8CAD0F6*A922999
      637A9272 A92A          :REM*64
183 DATA 4C6425A900 8DF5238DF6*2
      3EEF523D003EEF6232 1426902
      3C932D01CADF5          :REM*209
184 DATA 23D003CEF623CEF523A6*4
      4ADF5239DED3BADF623*9DEE3B4
      C36254C7A1FA6          :REM*167
185 DATA 2B201A1FA000202 1FC9*F
      FF00C99EB3AC8C0FEF0*0424905
      0ED20CCFFA9FF          :REM*53
186 DATA 99EB3AC82004262 3426*9
      0A54C6E258CEA3A98F0*0718655
      285529002E653          :REM*192
187 DATA 60A6292 00E1FA000B9F3*2
      320141FC8C0059 F52 *CCFF208
      51F9 0034C2C1F         :REM*160
188 DATA C9146 A25 8EC8 28EB9*0
      2A000240950 3878A230*8601B9E
      B3A24543 0CD1          :REM*30
189 DATA 5 F00AA23786 1584CC *2
      6915 C8CCEA3AD E5A2*3786 15
      8ADEA3AF00718          :REM*90
190 DATA 6550855090 2E651A551*C
      9FE6 8414B9EB3AA64D*A000245
      43 072 BE2F            :REM*203
191 DATA 5D0322 AF02E65 D002*E
      651A551A64DE7FF12*C9FE901
      3A97F854DA904          :REM*161
192 DATA 8551A900855 B005C9FE*9
      0160A414C8CCEA3AD*BC1862
      06425A91B4C7C          :REM*132
193 DATA 1FA940A2E3A0232 3724*A
      29CA9052 1524F 4985*3D2 642
      42 362E2 892           :REM*227
194 DATA 207924A55148A5548A0*0
      8B9D03899E43F881 F7*200324A
      6262 1A24F 20          :REM*119
195 DATA 853D2 64242 362E2 89*2
      020822468C55 D00868*C551D00
      3A91E2CA91B4C          :REM*103
196 DATA 7C1F4C61222 E1FFD06*2
      0CCFF4C61226 3427 C*D2454E4
      14D452 C6494C          :REM*224
197 DATA 45534327 DD343524154*4
      3482 C6494C4553A9 C*2 E1CA
      901A241A0272           :REM*191
198 DATA 3724A296A9 F2 F727A5*3
      AF022851 2 362EA953*2 C51D2
      02627A001B134          :REM*225
199 DATA C9BAD0062 8F272 581D*2
      0FE2EC61 D E34C6122*A003AE5
      239B134C9A F           :REM*15
200 DATA 079D5339E8C8D F38E52*3
      960A90C2 E01CA98 A2*32A0272
      03724A29FA9 F          :REM*230
201 DATA 20F727A54F8535A54E85*3
      4A53EF C62 2627A001*B134F01
      8A9522 C51DA0          :REM*156
202 DATA 1420 9127A93D9D5339EE*5
      2392 8F272 581DC63E*A534186
      92685349 2E6           :REM*147
203 DATA 354CC2278DA5388EA738*2
      02124A9E4A03F4C962C*202D282
      03628A007A213          :REM*30
204 DATA 182 F0FFADDD382 D2FF*2
      04B32A2E2A384C9932*A65DA45
      E184CF0FF382           :REM*196
205 DATA F0FF865D845E60A203A0*0
      0BD08DC204828C8CAD0*F6AD08D
      C60C000D01929          :REM*240
206 DATA FF100F297FC912F00F78*F
      8186912D858D006C912*D002A92
      4484A4A4A4A2           :REM*71
207 DATA 6E286829 F093099E338*C
      860AE08DCA4A29838E5*A2C9F7D
      0F8EC08DCF001          :REM*226
208 DATA 60A9212 A92AAD000 2C9*0
      8D0F42 FA289 EFAD03*02C93AD
      0E8CD062 D E3          :REM*47
209 DATA AD0FDC297F8D0FDCA000*2
      0E728C900F0D2C925B0*CEC9139
      00878F8E912D8          :REM*30
210 DATA 5809808D0BDCC82 E728*C
      960B0B78D0ADCC82 E7*28C960B
      0AC8D09DCA900          :REM*17
211 DATA 8D08DC60B901020A0A0A*0
      A8514C8B901 229 F05*14C860A
      000A200B901 02         :REM*33
212 DATA 2015299 0EC8CC000 2B0*0
      8E8E0029 EDC8B0E860*C93AB00
      3C9306 186 2           :REM*41
213 DATA 8A29CDD0 ADD0 A008B9*D
      10A9900028810F730 5*A9242 A
      92AAD0002C908          :REM*96
214 DATA D0F42 FA289 EFA92FCD*0
      302D0E8CD062D0E320*8133C90
      0F0DCC900DB0D8         :REM*79
215 DATA 8558208F33C900F0CFC9*2
      0B0CB85592 8F33C964*B0C2855
      AA000B9010299          :REM*120
216 DATA D20AC8C0089 F58CD10A*2
      08A298DD00A60A208A9*0018 7DD
      10ACA10F949AA          :REM*93
217 DATA 60A2054A6647664866 49*6
      64ACAD0F460A6351865*34900 1E
      84C8533A52AD0          :REM*182
218 DATA 0160A53A853D2 362E2 *8
      920B0016020A02F20E7*2FA9008
      5562 3A2A904 0         :REM*16
219 DATA A203A9009547CA10FBA9*1
      F20A729A2062 9A29A9*1C20A72
      92 9829A55AA2          :REM*110
220 DATA 0720 9A29A5592 9829A5*5
      8A2042 9A29ACEA3AA2*00B5479
      901 3BC8E8E004         :REM*143
221 DATA 90F5C6562 253 9 B6A5*5
      6F007208B31A9008556*202F30B
      0034CCA29A556          :REM*23
222 DATA F0032 8B312 0CCFFA9E1*4
      CC3FF20362EA53A853D*2089209
      016AEEA3AA003          :REM*29
223 DATA BDEE3AD134D00BC9A0F0*0
      6E8C8C0139 EF602 99*20D0DF6
      020E232A90185          :REM*85
224 DATA 1020962AC911F00FC991*F
      017C920F004C900DD0ED*A5106 0E
      610A510C5199 0         :REM*18
225 DATA E2F0E0B0DAC610D0DAA5*1
      9851 0D0D42052332007*282 0E4F
      FC900F0F6482 0         :REM*200
226 DATA 5533686 4820832B68A8*A
      207B51648CA10FAB960*388D923
      6B961388D9336          :REM*57
227 DATA B9623885 DA9008D0002*A
      28CA0362 0E632A617E8*E8A416C
      8182 0F0FF204B         :REM*235
228 DATA 32A900850AA9028 50BA5*1
      8207632A242A02B2099*322 0E4F
      FC900F0F9C903          :REM*119
229 DATA D0034C6122C90DF029C9*1
      4D00AAD0002F0C3CE00*02B0BEC
      9209 0BAC9809 0        :REM*67
230 DATA 04C9A0990B2AC0002C40D*B
      0AB9901 02EE0002D0A3*208E2BA
      200689516E8E0          :REM*160
231 DATA 089 0F8AD000260 05922 0*1
      2209D20A92AF0102081*33A61EC
      A300 7D51FD0F9         :REM*24
232 DATA 29FF6 186 382418A0A0*B
      9B705BEB7D9B00DB9A9*39BE493
      A99B7058A99B7          :REM*104
233 DATA D999A9398A99493A88D0*E
      1602 0BB1F1 0034C7134*4C5E2B2
      0BB1F1 034C6E          :REM*206
234 DATA 344C602B6605D553452 0*4
      35552534F522 4B4559*532 0544
      F204D4F56452 0         :REM*147
235 DATA 435552534F522C0D414E*4
      42 0D3D0C1C3C520544F*2053454
      C4543542C20D2          :REM*66
236 DATA C5D4D5D2CE2 544F2 45*5
      8454355544 52E0DD553*452 05F2
      0544F2 544F47          :REM*229
237 DATA 474C452 4D41524B4544*2
      046494C45532E3F05D5*5345204
      35552534F522 0         :REM*236
238 DATA 4B4559532 0544F2 4D4F*5
      6452 435552534F522C*0D414E4
      42 0D3D0C1C3C5         :REM*240
239 DATA 204F522 0D2C5D4D5D2CE*2
      0544F2 053454C454354*2E48 05D
      553452 0435552         :REM*228
240 DATA 534F522 4B4559532 054*4
      F204D4F56452 0435552*534F522
```

Continued on page 59.

Paint Versus Paint

Colors fly as two C-128 paint programs cross their brushes in a duel of creative capabilities.

By JOHN RYAN

With 16- and 32-bit computers catching the graphics spotlight nowadays, some people have forgotten that, in its day, the C-128 delivered unparalleled graphics power at an affordable price. True, the Commodore line is showing its age, but the graphics prowess of the C-128 is still as potent as when the machine was released. Nowhere is this more evident than in two paint programs for the C–128, I Paint from Voyager Mindtools and Master Paint from SilvaSoft.

These packages hold a lot in common. Both require that you run in 80-Column mode and have a 64K VDC chip if your C-128 has only 16K built in. Both run under Basic 8 from Patech Software, and both support RAM expansion units (REUs) and the 1351 mouse. (In fact, I Paint requires a 1351 or compatible mouse.) But, once past the shrinkwrap, the two programs diverge with different strengths and capabilities.

I Paint from Voyager Mindtools operates in 640 × 400 interlaced mode.

Master Paint from SilvaSoft allows you to import Print Shop graphics.

I Paint

I Paint, most notably, pushes the C-128 to the edge of the graphics envelope by invoking an Interlace mode. If you've ever met an Amiga, you already know a little about this mysterious mode. Without going into the technical details, Interlace doubles the vertical resolution of the screen by increasing the number of horizontal scan lines. So, while Master Paint offers a maximum screen resolution of 640 × 200 pixels, I Paint presents a canvas that is 640 × 400. Interlace not only increases resolution but, as an added benefit, gives you more colors to work with.

How many colors? How does a theoretical 65,536 sound? Yes, it sounds good, but it *is* a theoretical number. In everyday use you can achieve almost 4000 unique color combinations, and even this takes a lot of experimenting with the palette. Just remember the basic point here: I Paint on the C-128 will outperform an Amiga, which at high resolution (640 × 400) offers only 16 colors. That's saying a mouthful, and that's the power behind this great paint program.

If you've ever used a paint program on your computer, you'll have no problem getting set up and going with I Paint. Everything is controlled with a mouse and icons, and you'll find the normal assortment of tools to work with, plus a few that are unique to this program. I Paint offers three modes of freehand drawing mimicking the pen, brush and spray can. You'll also find options to create boxes, lines, circles and polygonal shapes.

An interesting feature of I Paint is its built-in ability to create three-dimensional objects. If you ever need to render solids, such as spheres, cylinders or spools, I Paint will do the job automatically according to your specifications. Likewise, you can clip and paste, as well as flip, reverse and reflect clips. You can even set up "safe" areas on the screen for "undoing" mistakes. How much of the screen you can set aside as safe depends on whether you're using an REU.

I Paint supports the Commodore 1700, 1764 and 1750 REUs, but not geoRAM. You can use the REU as you would any other disk drive, or you can devote the extra memory to large safe areas and clip operations. The 1581 disk drive is also supported.

I Paint offers up to seven fonts for text, and sports a bevy of features for placing text on the screen in different sizes, orientations and patterns. Files can be saved in either Lacemaker format (for owners of the Interlace Utilities Workshop) or I Paint format, both of which are compatible with Basic 8. You can save both picture files and clips (you can't save clips to the REU), and I Paint will send your screen to a printer.

Interlace mode, the feature that makes I Paint so powerful, also makes it irritating to work with. An inherent characteristic of this mode is called interlace flicker, a maddening "jitter" of the screen that can play havoc with your eyes and has plagued Amiga owners for years. You can't get rid of the jittery screen; all you can do is lessen it by staying away from bright, high-contrasting colors or by using a polarized screen filter, a thin plastic sheet fastened over the screen with a couple of velcro tabs. The filter I have works like a jewel with I Paint. You can purchase these filters through most mail-order Amiga software houses (who are acutely aware of long-suffering Amigaphiles with Interlace headaches). The author of I Paint suggests that you even try wearing polarized sunglasses—at the expense of a laugh or two. As outlandish as it sounds, the sunglasses really can help.

Master Paint

Master Paint serves up decent fare on the graphics table as well. While it doesn't offer quite the graphics power of I Paint, it does have some interesting features of its own.

The resolution of Master Paint is limited to 640 × 200. While I Paint lets you overlay colors on one another, Master Paint does not (because of its noninterlaced mode). Thus, you have only the 16

basic colors to work with, and each 8 × 2 pixel color cell may contain only one foreground and one background color.

Like I Paint, this program relies exclusively on icons for selecting drawing tools. If you don't own a mouse, Master Paint lets you substitute a joystick instead. But if you're an aspiring artist and plan on using either I Paint or Master Paint, you should buy a mouse anyway. Painting with a joystick is rather like washing your feet with your socks on—it just doesn't work well.

Master Paint offers many of the options available in I Paint: a nice selection of drawing tools, clip and paste functions, the ability to zoom in on a portion of the screen for detail work, and 3-D object rendering. It also lets you place text on your bit-mapped screen and offers over 20 fonts to choose from (in contrast to I Paint's seven).

This package has several unique and attractive features. Most notably, you can import Print Shop graphics into Master Paint. If you have Print Shop or regularly dial into BBSs or a national network, you'll have instant access to thousands of PS files! Unlike I Paint, Master Paint offers a true Undo feature, which means you can always erase your last action just by clicking the Undo icon (without having to worry about setting aside safe areas).

Thankfully, Master Paint includes horizontal and vertical ruler icons that let you locate color-cell boundaries quickly and easily. Moreover, REU owners can take a "snapshot" of the current screen and place it in the REU—a great option if you're about to try something risky with your gorgeous picture and don't want to take time to save it. Another handy feature of Master Paint is its movable polygons. You can quickly size a polygon, move it about freely and even paste multiple copies of it anywhere on the screen.

Palette selection is fairly basic and, with only 16 color combinations to deal with, more straightforward than I Paint's selection process. Like I Paint, you can save files to a disk or REU, although Master Paint does not support the 1581 disk drive.

Both I Paint and Master Paint omit several functions that would make them superlative—functions that have become standard in the Amiga community, the trend-setter for paint programs. One, keyboard equivalents are glaringly absent. To the seasoned digital artist, there's nothing more annoying than having to select functions with icons when a keypress or two would suffice. Also, since both programs offer REU support, it would be nice to have a "spare-screen" function. Master Paint does offer the snapshot feature, but I wish I could swap two screens in and out of memory and merge them.

Another nice feature would be a "stencil" option. Stencils let artists "lock" certain colors on the canvas, then effectively place colors or clips "behind" the locked areas. Likewise, I'd appreciate functions for fixing the background and aborting color fills—accidental or erroneous fills can waste a lot of time. (While they're in progress, I suggest you read RUNning Ruminations in the July/August '91 *RUN*.)

I Paint rates an A– in my book, Master Paint a B. Both packages offer many outstanding features not found in other paint programs. I Paint delivers the most power for the buck, and its Interlace mode, while annoying, offers graphics power that only Amiga owners have enjoyed until now. Master Paint, while a bit slower and less sophisticated, is somewhat more intuitive to use and a great paint program for beginners. ■

John Ryan writes articles and reviews for RUN *on a regular basis and is one of our contributing editors. He works as an air traffic control instructor in Mississippi.*

I Paint
Voyager Mindtools
PO Box 11578
Minneapolis, MN 55411
$39.95

Master Paint
SilvaSoft
PO Box 1006
Charlotte, VT 05445
$28.50 (includes shipping)

REVIEW SPECIAL

GateWay to GEOS

Enter a new realm of simplicity and versatility with this alternative interface to the GEOS desktop.

By MALCOLM O'BRIEN

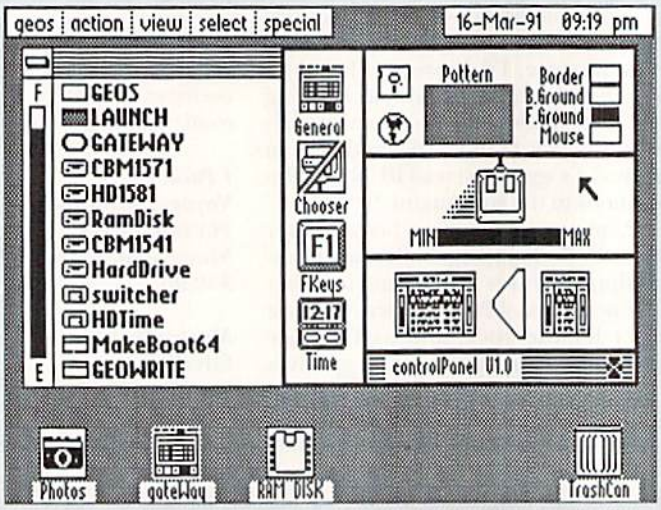
A few years back, Berkeley Softworks breathed new life into the C-64 (and later, the C-128) by developing GEOS. Since then, graphic user interfaces have become all the rage, and certainly there's a lot to be said for point-and-click simplicity. More recently, Creative Micro Designs has added even more life to GEOS with its powerful storage devices—the hard drives and RAMdrives. But life, even new life, is not without problems.

Specifically, GEOS was not created as an "open-ended" system. At first it supported 1541 disk drives and joysticks. Later revisions accepted a mouse or other input devices, a RAM expansion unit, and a 1571 or 1581 drive. All of these storage devices are Commodore products, and GEOS was altered specifically to accommodate them. There was no simple way to support other storage devices. (Note that the introduction of geoRAM resulted in a 2.0 version of GEOS.) Then Berkeley diverted its resources to the MS-DOS market, and it became necessary for someone else to rework the GEOS environment to be more flexible.

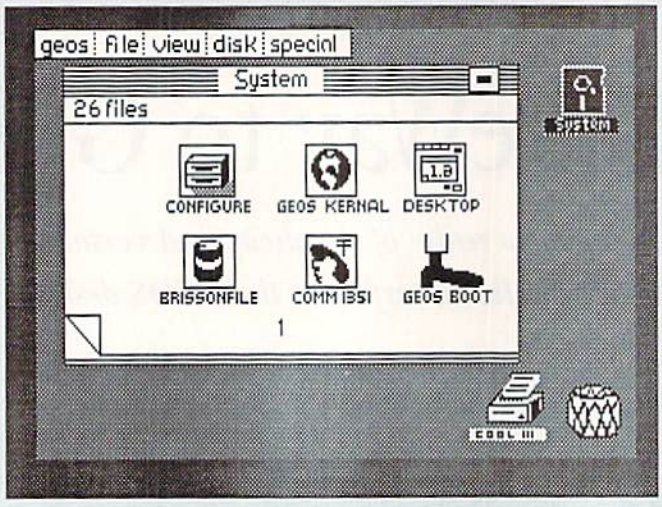
Enter Paul Bosacki. He's made GEOS more device-independent by creating separate, independent disk drivers for Commodore and alternative devices. Since there was no mechanism to allow this in the deskTop and Configure, Bosacki replaced them with a new, more flexible system, which he calls gateWay. Now it's possible to use GEOS with the 16-megabyte "native" partitions of the Commodore hard drive, as well as with RAMLink and RAMDrive.

There's also support for their subdirectories, something GEOS never had before. What's more, the gateWay design allows for support of not-yet-created devices. And we'll all want to use a graphic user interface with our CD-ROM drives one day, won't we?

Another significant difference between the deskTop and the gateWay is the latter's "documents." Essentially, a gateWay document is a subprogram that can be attached to the gateWay itself. As many as six documents can be integrated in this way, and several documents are provided on the system disk, along with a utility (GWMover) for adding and removing the documents from the sys- ►



The gateWay enhanced interface for GEOS.



The standard GEOS deskTop.

tem. When a document is attached, its name appears under the GEOS menu item.

The system disk supplies documents that create hard-drive subdirectories, load the date and time from the hard drive, view Photo Scraps, get expanded info, and task switch.

Task switching is a powerful technique that can dramatically improve your productivity. Essentially, it lets you switch between two running applications without exiting either! For example, imagine you're word processing with geoWrite. You hold down the COMMODORE key and press RESTORE (or ESCAPE on the C-128), and the geoWrite screen is replaced with a geoPaint screen. Copy an image to a Photo Scrap, press COMMODORE/RESTORE again and your geoWrite screen returns, ready for you to paste in the scrap. This application switching is instantaneous on the C-64 and takes only a few seconds on the C-128. Now you're beginning to imagine the possibilities!

System Requirements

The minimum requirements for using the gateWay are a C-64 or 128, a 1541 or 1571 disk drive, a 2.0 version of GEOS and a GEOS-supported input device. However, gateWay was written with the serious GEOS user in mind, so the more drive storage and extra RAM you have, the more useful the system becomes.

There is no provision for copying files or disks on single-drive systems with gateWay, and systems without any additional RAM operate under two restrictions. First, because some expanded RAM is used to store disk drivers, without extra RAM only two drive types are available. (An auto-exec program called the Integrator automatically integrates the two appropriate disk drivers on your gateWay system disk if it finds no extra RAM.) Second, without an REU no task switching is possible.

Thanks for the Memory

If you have a Commodore 1700 REU with 128K, you can use three drives and switch tasks via the Switcher program, but you cannot create a RAMdisk. If you have a 1764 REU with 256K, you can create a RAMdisk but not use the Switcher. All features of the gateWay are accessible if you have 512K or more of extra RAM (in other words, an expanded 1700 or 1764, geoRAM, or the 1750).

The driver for these fatter devices will create a RAMdisk of up to two megabytes! This provides maximum access if you've expanded your REU or geoRAM beyond 512K. There are also two special RAM drivers, one optimized for geoRAM and the other designed for RAM41_71. The latter permits backward compatibility with some programs that use portions of the REU for their own purposes.

With a RAMLink or RAMDrive, you can use two drivers: RLDrive for Native mode partitions of any size (up to 16 megabytes!) and RL1581 for 1581-emulation partitions. If you use both an REU or geoRAM and a populated RAMLink, they can serve as a single device or as two separate devices. A total of ten disk drivers are supplied with the gateWay system.

Look and Feel

GateWay combines features of GEOS, the Macintosh, Windows and the Amiga Workbench. The disk notepad has a resizing gadget. You can view filenames by type and search for filenames. A scroll bar and arrows (or the cursor keys) let you view the list of 12 filenames on-screen. A "fuel gauge" shows how much disk space is occupied and free.

The Control Panel lets you define function keys, set mouse speed, date and time, and change colors, patterns, input and printer drivers. Click on a file-type icon (to the left of the filename) and get file info; click on the fuel gauge and get disk info. That's right, disk info.

The gateWay is radically different from the deskTop in handling disks as though they were files. When files are highlighted, the Rename option renames those files; when no files are highlighted, it renames the disk. The Erase option will either erase the highlighted files or perform a short New—so be careful! You can enter data in the disk's info box just as if it were a file, plus assign each disk a distinctive icon (which shows up when the disk is opened). It's also possible to copy files to drive C without "manually" swapping drives. When an application needs drive C swapped in, gateWay does the job automatically. And, ►

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yes, you can open the TrashCan and restore the file you erased by mistake.

One of gateWay's nicest features is a cold boot that doesn't reformat the RAMdisk. If your RAM hasn't been altered, gateWay recognizes it and leaves your files intact. This is a timesaver; I've had the same RAMdisk in place for weeks.

GateWay is slick, logical, practical and well thought out. Therefore, I give it an A. Serious GEOS users can finally take full advantage of today's hardware—and tomorrow's. ■

Malcolm O'Brien has been writing Commodore articles and reviews since 1984. For two years he was editor of The Transactor.

Gateway
Creative Micro Designs
50 Industrial Drive, Box 626
East Longmeadow, MA 01028
800-638-3263
$29.95, in C-64 and 128 versions

gateWay 64 Bug Fixes

Version 2.12 of gateWay contains fixes to certain bugs that existed in the release version. Briefly, they are:

- A problem with booting from 1541 disk drives. The turbo code was not being downloaded to the drive, so the drive would lock up during boot.
- A problem with printer selection in the Control Panel chooser. The chooser was deleting the last character in a printer driver name, so would not recognize newly selected drivers.
- A date-setting problem in the Control Panel whereby *Jun* was converted to *Jan* when entered manually.
- A corrupt file (switcher_r).
- A problem with subdirectory creation in the Makedir document that caused incorrect data to be written when a subdirectory was created on Commodore drives. This would show up during attempted validations on that partition.
- A problem with subdirectory conversions to the GEOS disk type in disk drivers (hardDrive and RLDrive).

REVIEW SPECIAL

Super Cartridge

An old adage: Never buy a program whose documentation comes folded in half.

By JOHN RYAN

If the above statement contains some truth, then Super Cartridge, from Utilities Unlimited, suggests a new adage: Never buy a cartridge that comes with *no* documentation.

The Super Cartridge from Utilities Unlimited contains a collection of 30 utilities designed to make C-64 computing easier by placing oft-needed programs at your fingertips. The cartridge slips into the game port and displays a menu after power up. From there you can either select a utility to run or exit to Basic, with or without a DOS wedge installed.

The DOS wedge and Nibble copier are the only Super Cartridge utilities I would get any mileage from. Some of the others are arcane or poorly conceived. The disk nibbler does a respectable job of copying disks. It supports multiple drives, and with one drive will copy a disk in three-and-a-half passes. The Fast File Copy routine, on the other hand, is anything *but* fast when using one drive. It copies only one file at a time, regardless of the size, before telling you to swap disks. So, if you want to copy 20 files, you have to make 20 disk swaps. (The C-64 *does* have 64K, doesn't it?)

The Super Cartridge includes two terminal programs for modem owners: Punter Term, which supports the Punter protocol, and a program named X-modem, which supports the protocol of the same name.

While X-modem is the better of the two, neither is full-featured or user-friendly. In fact, about the most you can do with them is dial one number (you have to enter it, because there's no telephone log), upload, download, open a capture buffer, read text files and access the disk. That's it!

A few of the other programs may interest you. There is a text editor for reading or editing text files, a label maker, a drive unit changer, a calendar maker, a fast disk formatter and a file "unscratcher."

The remainder of the programs are out of the mainstream. They include one to save machine code from under Kernal or I/O ROM, a disk track and sector editor, a variable cross referencer, HESMON monitors, utilities to compact and uncompact Basic programs, and a disk search function to locate selected data on a disk.

Only a page-and-a-half of documentation comes with Super Cartridge, and it merely tells what the programs are and what they do. The author states that the menus are self-explanatory, but, especially for the terminal programs and DOS wedge (how many of us can still find our DOS wedge documentation?), a few paragraphs would be greatly appreciated.

The cartridge exits to Basic after you leave an application, with no apparent way for you to get back to the main menu short of rebooting. And C-128 owners will find themselves booted into C-64 mode automatically with the cartridge installed.

I give the Super Cartridge a D. It's disappointing, especially because many similar utilities of better quality and with documentation are available in the public domain. The final word is, the Super Cartridge isn't. ■

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RRRRRollerdashhhhh

It's time to put on your 'blades and sizzle down the sidewalk!

By TONY BRANTNER

Slip on your blades and slide into your spandex—you'll need to be agile to make it through this challenge! In Rollerdash, you race down a sidewalk strewn with trash cans and other obstacles.

Move your joystick in any direction to begin the action. Each time you tap the joystick to the right, the skater will push forward, accompanied by sound effects. Keep him pushing to build up speed; let him relax and he'll slow down again.

When the skater approaches a tire, garbage can or barricade, press the joystick up to make him leap. He can make it if he's built up enough speed and you time the jump correctly. He'll also meet low signs hanging out from the brick wall. Pull the joystick down to make him duck. If he bumps into an obstacle, he'll slow down and have to regain his momentum.

Current speed, distance traveled and time remaining are displayed at the bottom of the screen. Each time the distance read-out increases, your score rises ten points. Reach the end of the sidewalk, and you get a bonus of 100 times the seconds left on the clock. At level 1, the timer starts counting down from 100; it decreases by five at each new level. Anytime you want to pause the game, press the SHIFT-LOCK key.

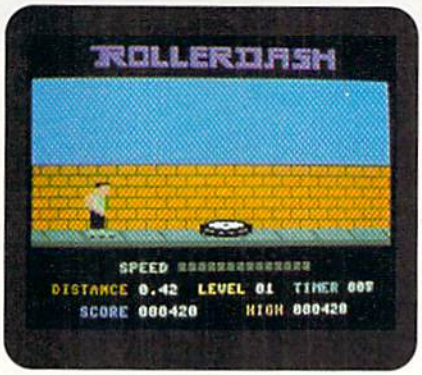
Type in Rollerdash from Listing 1, using the Checksum program on page 61 to catch any typing errors. Once you have it typed in, run it to create the file ROLLERDASH.ML. To play the game, load and run the program, making sure your joystick is plugged into port 2. You'll soon be up to speed . . . but watch out for that trash can! R

Tony Brantner, a carpenter by trade, has written lots of games for RUN. *He particularly enjoys the C-64's graphics capabilities.*

Listing 1. Rollerdash program. (Also available on the September/October ReRUN disk. To order, call 800-343-0728.)

```
Ø REM THIS LIST 1 CREATES (AND
  SHOULD NOT BE CALLED) ROLLERD
  ASH.ML                :REM*111
5 OPEN 8,8,8,"ROLLERDASH.ML,P,W
  "                     :REM*92
6 CT=Ø:PRINT"{SHFT CLR)":REM*56
1Ø READ A$:IF A$="-1" THEN CLOS
  E8:PRINT:PRINT"ALL DONE!":EN
  D                     :REM*129
12 PRINT"{HOME}READING LINE "+S
  TR$(CT):CT=CT+1       :REM*141
15 IF LEN(A$)<62 THEN 55
                        :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
  2Ø)+MID$(A$,43,2Ø)    :REM*242
25 FOR I=1 TO 3Ø        :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                        :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55             :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55             :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                        :REM*67
5Ø NEXT:GOTO 1Ø         :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
  O 7Ø                  :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
  A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
  )):GOTO 7Ø            :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
  Ø)+RIGHT$(A$,LEN(A$)-42)
                        :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                        :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55             :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55             :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                        :REM*148
95 NEXT:GOTO 1Ø         :REM*16Ø
1ØØ REM HEX DATA FOR ROLLERDASH
                        :REM*11Ø
1Ø1 DATA Ø1Ø8ØBØ8ØAØØ9E323Ø36*3
  1ØØØØØØA9Ø82ØD2FFA9*8E2ØD2F
  FA9932ØD2FF2Ø         :REM*234
1Ø2 DATA 9CØCA9938539A9ØE853A*A
  9ØØ853BA93C853CA2ØB*AØØØB13
  9913BC8CØ4Ø9Ø         :REM*221
1Ø3 DATA F7189865398539A53A69*Ø
  Ø853A1898653B853BA5*3C69ØØ8
  53CCADØDAA9ØØ         :REM*237
1Ø4 DATA 8D2ØDØ8D1BDØA9Ø18D17*D
  Ø8D1DDØA9ØA8D25DØA9*ØØ8D26D
  ØA9ØD8D27DØA9         :REM*233
1Ø5 DATA Ø38D1CDØ8D15DØA2ØØAØ*Ø
  7182ØFØFFA926AØØD2Ø*1EAB2Ø1
  BØBAØ27A9ØC99         :REM*31
1Ø6 DATA A8DAA2AØ9829Ø3DØØ2A2*C
  D8A99A8Ø6881ØEBA214*AØØA182
  ØFØFFA985AØØD         :REM*252
1Ø7 DATA 2Ø1EABA9Ø18D53112Ø91*Ø
  CA9ØØA8995411C8DØFA*2Ø28ØCA
  9968D5411A93C         :REM*2Ø7
1Ø8 DATA 8D5611A9FØ8DF8Ø78D57*1
  12Ø3EØC2Ø95ØB2Ø68ØB*AD53112
  ØAEØB8C88Ø78D         :REM*14
1Ø9 DATA 89Ø7AD5311ØAØA186D53*1
  185Ø238A969E5Ø28D62*112Ø85Ø
  BADØDC29ØFC9          :REM*76
11Ø DATA ØFFØF72ØE1FFDØØ1ØØAD*8
  DØ2C9Ø1FØF9E6Ø42ØF2*Ø918A5Ø
  6691Ø9ØØ62ØF1         :REM*188
111 DATA ØBAD5E1185Ø6A5Ø4291F*D
  ØØ8AD5E11FØØ3CE5E11*18AD5F1
  16D5E118D5F11         :REM*126
112 DATA 9ØØ62Ø8CØA2ØE9ØA2Ø3E*Ø
  C2ØD8ØA2Ø95ØBAD6411*C964BØ1
  ØAD6211FØ4E2Ø         :REM*23Ø
113 DATA 78ØBAØ5588DØFD4C1ØØ9*2
  Ø28ØCA9Ø48DØCD4A932*8DØ8D4A
  D6211FØ1CA21Ø         :REM*6Ø
114 DATA 8EØBD4E88EØBD4AØØ32Ø*6
  1ØCCE62112Ø85ØBA9Ø3*2Ø36ØC4
  C7EØ9AC5311C8         :REM*24Ø
115 DATA CØØBBØØ38C5311A9F2AØ*Ø
  D2ØC7ØB4CBEØ82Ø28ØC*A99C8DØ
  CD4A9ØØ85Ø5A5         :REM*135
116 DATA Ø5ØA85Ø238A9Ø9E5Ø28D*Ø
  8D4A22Ø8EØBD4E88EØB*D4A5Ø5Ø
  AØA1869322Ø36         :REM*29
117 DATA ØCE6Ø5A5Ø5C9Ø49ØD8A9*1
  1AØØE2ØC7ØB4CB6Ø8AC*6Ø11DØ2
  BADØØDC29ØFCD         :REM*72
118 DATA 6511FØ138D6511AØØ1C9*Ø
```

RUN it right: **C-64; joystick**



Jump the junk to stay on your feet.

```
    EFØ1ØC8C9Ø7FØØBC8C9*ØDFØØ6A
    9FØ8DF8Ø76Ø8C        :REM*1Ø5
119 DATA 6Ø11A9ØØ8D611188FØ3Ø*8
    8FØØ8A9F58DF8Ø74C7C*ØAAD611
    14A4A4A4A4A4A         :REM*124
12Ø DATA A8B9F2ØC8DF8Ø7AD6111*2
    9Ø7DØ35AC5E11C8CØ78*BØ2D8C5
    E114C7CØAA9F4         :REM*148
121 DATA 8DF8Ø7AD61114A4A4AC9*1
    ØBØØD85Ø238A996E5Ø2*8D54114
    C77ØA1869778D         :REM*145
122 DATA 5411A5Ø44A9ØØFEE6111*D
    ØØAA9ØØ8D6Ø11A9968D*54116Ø3
    8AD5711E9Ø18D         :REM*245
123 DATA 5711A8AD5911E9ØØ29Ø1*8
    D5911FØ35CØFADØ31AD*1BD44A1
    869Ø8D5711AD          :REM*24
124 DATA 1BD429ØFA8B9F6ØCAA18*6
    9F68DF9Ø7B9Ø6ØD8D1D*DØB916Ø
    D8D28DØA9ABEØ         :REM*249
125 DATA Ø2DØØ2A98C8D55116ØAD*1
    EDØ4A9ØØAA9ØACD5E11*BØØ38D5
    E116Ø38AD5B11         :REM*173
126 DATA E9Ø129Ø78D5B118D5C11*C
    9Ø7DØ1FADB9Ø5ACB8Ø5*2Ø29ØBA
    EA8Ø6AØØØB9A9         :REM*229
127 DATA Ø699A8Ø6C8CØ27DØF58E*C
    FØ62Ø51ØB6ØAØFØA9Ø9*8899B8D
    9DØFAA977AØ5Ø         :REM*45
128 DATA 85Ø284Ø3A9Ø685Ø5AØØØ*A
    214A5Ø299B8Ø5C8A5Ø3*99B8Ø5C
    8CADØF1A6Ø3A5         :REM*222
129 DATA Ø285Ø386Ø2C6Ø5DØE36Ø*E
    E6311AD6311C9ØC9Ø1C*A9ØØ8D6
    311EE6411AØØ4         :REM*41
13Ø DATA 2Ø61ØCAD64112ØAEØB8E*7
    CØ78C7EØ78D7FØ76ØA5*A2C9269
    Ø16A9ØØ85A2CE         :REM*159
131 DATA 6211AD62112ØAEØB8E92*Ø
    78C93Ø78D94Ø76ØAD5E*114A4A4
    A85Ø5AØØEA9ØB         :REM*112
132 DATA 993ØDBC4Ø5DØØ2A9Ø788*1
    ØF46ØA23ØAØ3ØC9649Ø*Ø5E964E
    8DØF7C9ØA9ØØ5         :REM*7Ø
133 DATA E9ØAC8DØF7Ø93Ø6Ø8539*8
    43AA2Ø7AØØ5182ØFØFF*A539A43
    A2Ø1EABA91E2Ø          :REM*22Ø
134 DATA 36ØCA2Ø72ØFFE9A9ØA2Ø*3
    6ØCADØØDC291ØDØDB6Ø*AD6711F
    Ø04CE67116ØAD         :REM*84
135 DATA 6611ØA186D6611A8B94A*Ø
    EDØ48D66116Ø8D6711*A24Ø8EØ
    4D4B94BØE8DØ1         :REM*196
136 DATA D4B94CØE8DØØD4E88E04*D
    4EE66116ØAØØØB931ØE*99ØØD4C
    8CØ199ØF56Ø18         :REM*41
137 DATA 65A2C5A2DØFC6ØAD5411*8
    DØ1DØAD56118DØØDØAD*55118DØ
    3DØAD57118DØ2         :REM*174
138 DATA DØAD5911ØAØD58118D1Ø*D
    Ø6Ø38B9CCØ769ØØC93A*9ØØ2A93
    Ø99CCØ7881ØEF         :REM*221
139 DATA AØØØB9CCØ7D9DCØ79Ø13*D
    ØØ6C8CØØ69ØF16ØAØØ5*B9CCØ79
    9DCØ7881ØF76Ø         :REM*53
14Ø DATA AØØ5A93Ø99CCØ7881ØFA*6
    Ø78A9B88D14Ø3A9ØC8D*15Ø3A9Ø
    Ø8D12DØA91B8D         :REM*118
141 DATA 11DØA9818D1ADØ586ØAD*1
    9Dø8D19DØ3ØØ7ADØDDC*584C31E
    AAØØ3AD12DØD9         :REM*242
142 DATA E9ØCBØØ388DØF8B9EEØC*8
    D21DØB95A118D16DØB9*EAØC8D1
    2Dø4CBCFE4A8A         :REM*114
143 DATA BAC64AØE8Ø8BØØF1F2F3*F
    ØØØØØØØØØ1Ø1Ø2Ø2Ø2*Ø2Ø3Ø3Ø
    3Ø3Ø4Ø4Ø1Ø1Ø3         :REM*22
144 DATA Ø3Ø1Ø1Ø1Ø1Ø3Ø3Ø1Ø1Ø3*Ø
    3Ø1Ø1Ø1FØ1ØFØDØF Ø1*Ø7ØFØ3Ø
    1ØE1ØE7Ø79C           :REM*112
145 DATA B8122ØC392A112ACBBB4*9
    22Ø12B4922Ø12B4C3B4*C392A11
    2BB92B812A7A1          :REM*6Ø
146 DATA C3B6B4C3B492A212A7ØD*2
    Ø2Ø2Ø2Ø2Ø2Ø2ØAC122Ø*92DF12D
    FBCBEB492A212          :REM*19
147 DATA B492A212B492A212B492*D
    F12DFBE92A212A7BE92*2Ø12B69
    2A2122ØB4922Ø          :REM*18
148 DATA 12A7ØDØØ995350454544*2
    Ø9712BABABABABABA*BABABAB
    ABABABAØDØD2Ø          :REM*6
149 DATA 2Ø2Ø814449535414E43*4
    52Ø053Ø2E3Ø3Ø2Ø2Ø9E*4C45564
    54C2Ø053Ø3Ø2Ø          :REM*81
15Ø DATA 2Ø9F54494D4552Ø0530*3
    Ø3ØØDØD2Ø2Ø2Ø2Ø2Ø2Ø*9A53434
    F52452Ø053Ø3Ø          :REM*65
151 DATA 3Ø3Ø3Ø3Ø2Ø2Ø2Ø2Ø296*4
    8494748Ø2Ø053Ø3Ø3Ø3Ø*3Ø3ØØØ2
    ØØ54C4556454C          :REM*45
152 DATA 2Ø434F4D5Ø4C45544544*2
    Ø2D2Ø5Ø524553532Ø46*4952450
    ØØ554494D452Ø          :REM*243
153 DATA 4841532Ø45585Ø495245*4
    4212Ø2D2Ø5Ø52455353*2Ø46495
    2450000000Ø07          :REM*17Ø
154 DATA ØØ1AØAØØØØØØØØØØØØØ*F
    FFFØØØØ8ØØØØØØ1E91*9FØ9Ø48
    BØ9Ø446ØCØ516          :REM*12Ø
155 DATA ØFØ48BØCØ44612Ø66BØ9*Ø
    48BØ9Ø446ØCØ516ØFØ4*8BØCØ44
    612Ø66BØ9Ø48B          :REM*149
156 DATA Ø9Ø446ØCØ516ØCØ48BØC*Ø
    48BØCØ516ØCØ48BØCØ4*8BØCØ51
    6ØFØ48BØ9Ø446          :REM*172
157 DATA ØFØ66BØØØØØØØØØØFCØ*Ø
    ØØD4ØØØØ54ØØØØ54ØØØ*25ØØØØ5
    9ØØØ5AØØØØ5A          :REM*8Ø
158 DATA ØØØØ5AØØØØ16ØØØØ35ØØ*Ø
    Ø3DØØØØ3FØØØØ3FØØØØ*3FØØØØ3
    FØØØØ3FØØØØ22         :REM*1Ø3
159 DATA ØØØØ2AAØØØ333ØØØØØØØ*Ø
    ØØØØØØØØØFCØØØØD4Ø*ØØØ54ØØ
    ØØ54ØØØ95ØØØ1         :REM*186
16Ø DATA 658ØØ16A8ØØ52A4ØØ52A*4
    ØØ16854Ø1FC1ØØØFCØØ*ØØFFØØØ
    3FFØØØFCFØØØF         :REM*61
161 DATA ØFØØØ8Ø8ØØØA8A8ØØCCC*C
    ØØØØØØØØØØØØØØØØ3F*ØØØ35Ø
    ØØØ15ØØØ15ØØ         :REM*252
162 DATA Ø254ØØØ596ØØ15AAØØ14*A
    94Ø14A854Ø5A81ØØ4FC*ØØØFFØ
    ØØFFCØØ3FFCØ          :REM*4
163 DATA EBF3CØ2BC3CØ2ØØ2ØØEØ*Ø
    2AØØØ33ØØØØØØØØØØ*ØFCØØØØ
    D4ØØØØ54ØØØØ5         :REM*116
164 DATA 4ØØØ95ØØØ1658ØØ56A8Ø*Ø
    52A4ØØ15A4ØØØ6A5ØØØ*3F14Ø03
    FDØ3AFFCØØAFF         :REM*141
165 DATA CØØ8Ø3CØ38Ø3CØØØØ3CØ*Ø
    ØØ2ØØØØØ2AØØØØ33ØØØ*ØØØFCØØ
    ØØD4ØØØ954ØØ2         :REM*24
166 DATA 954ØØ5A58ØØ5AA4Ø142A*5
    Ø5ØFAF513FFFCØ3FFFC*Ø3FFFCØ
    ØFC3CØØFC3CØØ         :REM*233
167 DATA 2Ø2ØØØ282AØØ3C33ØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØ*ØØØØØØ2
    6ØØØØØØØØØØ          :REM*154
168 DATA ØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØFCØØØØD4ØØØ95*4ØØ2954
    ØØ5A58ØØ5AA4Ø         :REM*136
169 DATA 142A5Ø14FBD513FFF417*F
    FFØ13FFFØØØFØFØØØ8Ø*8ØØØAØA
    8ØØFØCCØØØØØ          :REM*76
17Ø DATA ØØØØØØØ1ØØØ1Ø1ØØØ1Ø*3
    ØØØ3Ø9999989999899*99983ØØ
    Ø3Ø3ØØØ3Ø2ØØØ         :REM*55
171 DATA 2Ø2ØØØ2Ø2ØØØ2Ø2ØØØ2Ø*2
    ØØØ2Ø2ØØØ2Ø2ØØØ2Ø2Ø*ØØ2Ø2ØØ
    Ø2Ø2ØØØ2Ø2ØØØ         :REM*48
172 DATA 2ØØØØØEAØØØEEØØ3AAA*A
    83FFFFC3AAAA8EEBAEE*FEBAEØØ
    EBAEØØEBAEØØE          :REM*69
173 DATA BAEØØEBAEØØEBAEØØEBA*E
    ØØEBAEØØEBAEØØEBAEØ*ØFBEFØØ
    EAAAØØFFFFØØE          :REM*125
174 DATA AAAØØFFFFØØØØØØØØØ3*Ø
    ØØØØ3CØØØ33ØØØØ3ØC*ØØØ333Ø
    ØØ3C3CØØ3ØF3Ø         :REM*115
175 DATA ØØØBØCØØØACFØØØABCØØ*Ø
    AACØØØAABØØØAABØØØA*ABØØØAA
    BØØØ2ABØØØØAB          :REM*19
176 DATA ØØØØ2BØØØØØBØØØØ326*Ø
    ØØØØØØØØØØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØ           :REM*171
177 DATA ØØØØØØØØØØFCØØØFFFCØ*3
    EAAFØFABABCFABABCFE*AAFCFFE
    FFCCFFFCCF3FF          :REM*182
178 DATA 3CFF33FC3FFFFØ3FFFFØ*Ø
    3FFØØØØØØE8ØØØØE8ØØ*Ø3AAØØØ
    3AAØØØFEBØØØE          :REM*168
179 DATA AA8ØØFFFØØØ3AAØØØ3AA*Ø
    ØØEAB8ØØEBB8ØØEBB8Ø*ØFAFCØØ
    3AAØØØ3AAØØØ3          :REM*198
18Ø DATA AAØØØ3AAØØØ3AAØØØFFF*Ø
    ØØEAA8ØØFFFCØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØ           :REM*128
181 DATA ØØØØØØØØØØØØØØØØ
                           :REM*14Ø
182 DATA -1                :REM*36 ■
```

RUN it right: **C-64; joystick**

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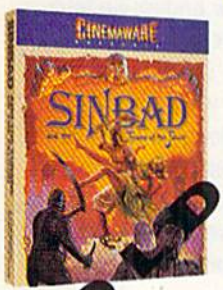

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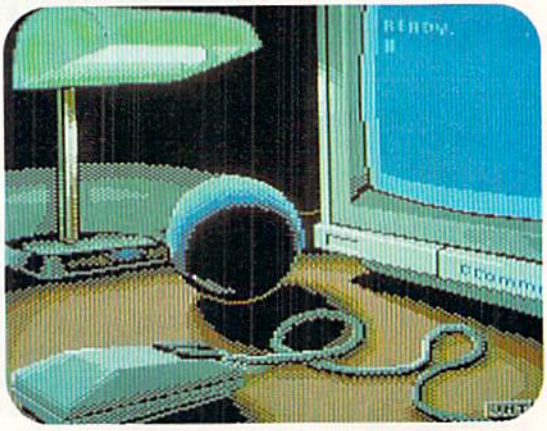

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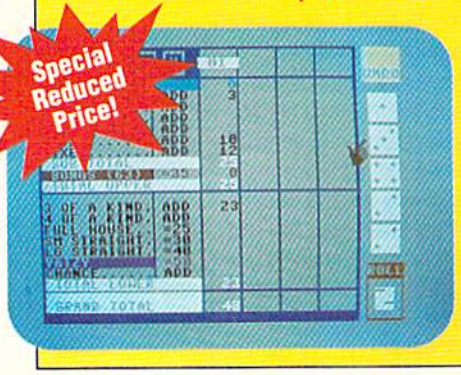

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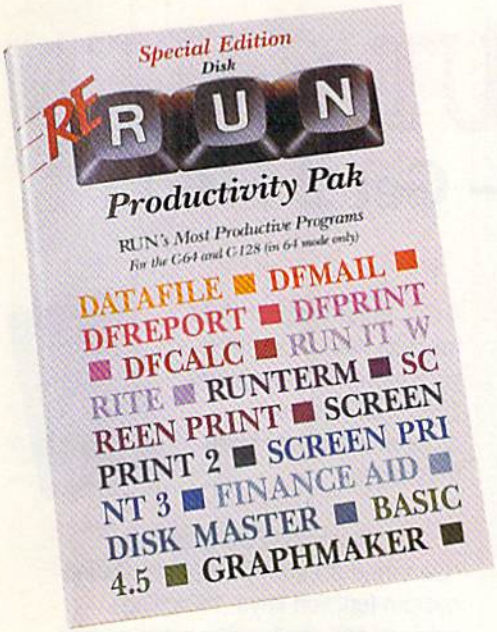
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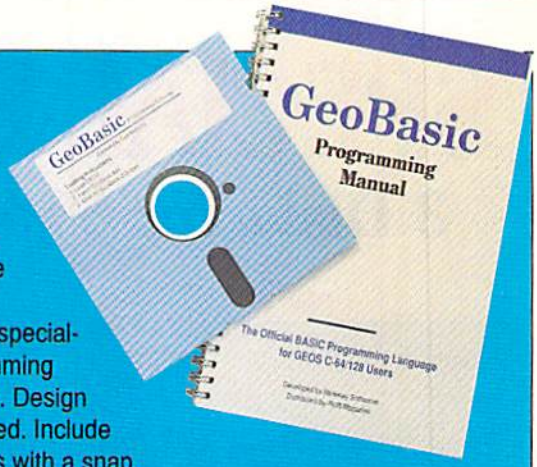

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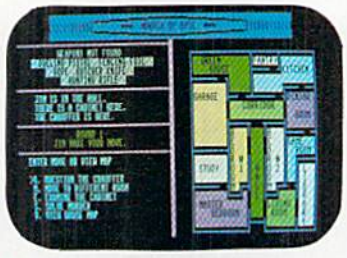

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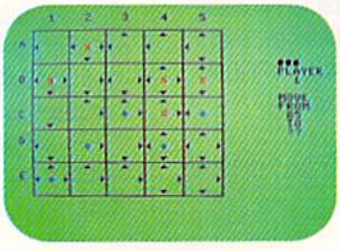

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Fraction Action

Fractions aren't always easy, but with this fun way to learn young students can make them simple.

By WILLIAM SNOW

The most difficult part of working with fractions, whether adding, subtracting, multiplying or dividing, is making sure the answer is in simplest form—that is, with no divisor common to both the numerator (the number above the line) and the denominator (the number below the line). For example, 1/5 and 5/17 are in simplest form, but 2/6 and 4/16 are not.

I wrote Keep It Simple (K.I.S.) to help my fifth-grade students distinguish between fractions that are simple and those that are not, and it gives them all the practice they need. The game screen is a colorful five-by-five grid, with a randomly chosen fraction in each square. Numerators and denominators can be up to 19, and play is accompanied by appropriate sound. Type in the program from Listing 1, and use *RUN*'s Checksum program on page 61 to catch any typing mistakes.

The game seems easy at first: All you do is use the joystick to move the smiley face around the grid and hit the fire button on fractions that are simple. But then you find you mustn't fire on fractions that aren't simple or on blank spaces. And watch out for that simpleton! If you take too long thinking about a fraction, he'll catch up with Smiley and you'll lose a life. Lose three lives and the game is over. To add challenge, the simpleton's speed increases as the game progresses. When the game is over you can play again or quit—or you may just want to study the fractions you missed for a while.

Since K.I.S. is written in Basic, it can be modified easily to give practice in other areas. For instance, you could substitute simple addition, subtraction, multiplication or division problems for the fractions that are built in. Lines 190–230 select random numbers for constructing the problems. Lines 490–510 determine whether a fraction is in simplest form and flag it if it's not. If you want to modify the program, use those lines to check which problems are correct and flag them. Lines 240–290 print the problems on the screen within the grid.

Because playing K.I.S. is so much fun, students may not even be aware that (Heaven forbid!) they're learning. It's surprising how quickly they *will* learn; after getting zapped a few times, they'll be checking fractions quickly and accurately. What could be . . . *simpler*? R

William Snow has been teaching school in McHenry, Illinois, for 25 years. He's been programming Commodore computers as instructional aids since 1983.

Listing 1. K.I.S. program. (Also available on the September/October ReRUN disk. To order, call 800-343-0728.)

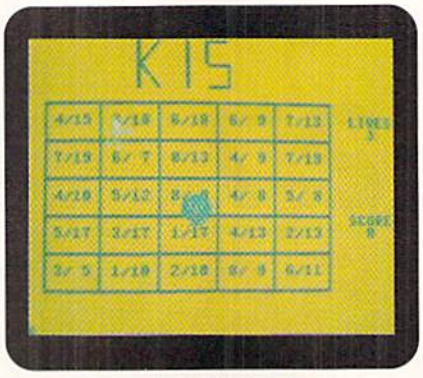
```
10 REM KEEP IT SIMPLE - WILLIAM
   F. SNOW                 :REM*15
20 GOSUB1120               :REM*77
30 CLR:J$="{HOME}{8 CRSR DNs}":
   K$="{HOME}{11 CRSR DNs}":Q$=
   "{HOME}{14 CRSR DNs}"
                           :REM*255
40 M$="{HOME}{17 CRSR DNs}":O$=
   "{HOME}{20 CRSR DNs}":P$="{4
    SPACEs}"               :REM*23
50 POKE2040,13:FORSA=0TO62:READ
   SB:POKE832+SA,SB:NEXT:REM*53
60 POKE2041,14:FORSC=0TO62:READ
   SD:POKE896+SC,SD:NEXT
                           :REM*154
70 POKE2042,15:FORSE=0TO62:READ
   SF:POKE961+SE,SF:NEXT
                           :REM*184
80 DIM F$(25),F(25):S=53248:POK
   ES+30,0:SN=54272:POKESN+24,1
   5                       :REM*254
90 PRINT"{SHFT CLR}{2 CRSR DNs}
   "SPC(11)"{COMD L} {SHFT N}{2
    SPACEs}{COMD L} {COMD L}{2
   COMD Ys}"SPC(30)"{COMD L}{SH
   FT N}{3 SPACEs}{COMD L} {COM
   D L}"SPC(32)"{COMD L}{SHFT M
   }{3 SPACEs}{COMD L}{2 SPACEs
   }{2 COMD Ys}{COMD H}":REM*99
100 PRINT SPC(11)"{COMD L} {SHF
    T M}{2 SPACEs}{COMD L}{2 SP
    ACEs}{2 COMD Ps}{COMD H}"
                           :REM*61
110 L$="{SHFT O}{4 COMD Ys}{SHF
    T P}{5 COMD Ys}{SHFT P}{5 C
    OMD Ys}{SHFT P}{5 COMD Ys}{
    SHFT P}{5 COMD Ys}{SHFT P}{
    10 SPACEs}"            :REM*183
120 LL$="{COMD G}{4 SPACEs}{COM
    D N}{5 SPACEs}{COMD N}{5 SP
    ACEs}{COMD N}{5 SPACEs}{COM
    D N}{5 SPACEs}{COMD N}{10 S
    PACEs}"                :REM*57
130 PRINT"{HOME}{7 CRSR DNs}{2
    CRSR RTs}";            :REM*100
140 FORQ=1TO5:PRINTL$;:PRINTLL$
    ;:PRINTLL$;:NEXTQ      :REM*251
150 PRINT"{30 COMD Ys}" :REM*93
160 IF PC=0 THEN LV=3      :REM*45
170 PRINT"{HOME}"SPC(34)"{8 CRS
    R DNs}LIVES":GOSUB880
                           :REM*124
180 FORCC=1TO25:F(CC)=0:NEXTCC
                           :REM*70
190 PRINT"{HOME}"SPC(34)"{16 CR
    SR DNs}SCORE":PRINTSPC(35)S
    R                      :REM*179
200 FORX=1 TO 25:N=INT(RND(.)*8
    )+1                    :REM*32
210 D=INT(RND(.)*19)+1:IF D<=N
    THEN210                :REM*12
220 GOSUB520:NN$=STR$(N):N$=RIG
    HT$(NN$,1)             :REM*172
230 DD$=STR$(D):D$=RIGHT$(DD$,2
    )                      :REM*87
240 F$(X)=N$+CHR$(47)+D$:NEXTX
                           :REM*241
250 PRINT"{HOME}{8 CRSR DNs}{3
    CRSR RTs}"F$(1)SPC(2)F$(2)S
    PC(2)F$(3)SPC(2)F$(4)SPC(2)
    F$(5)                  :REM*190
260 PRINTTAB(83)F$(6)SPC(2)F$(7
    )SPC(2)F$(8)SPC(2)F$(9)SPC(
    2)F$(10)               :REM*121
270 PRINTTAB(43)F$(11)SPC(2)F$(
    12)SPC(2)F$(13)SPC(2)F$(14)
```

RUN it right: **C-64; joystick**

```
    SPC(2)F$(15)          :REM*155
28Ø PRINTTAB(83)F$(16)SPC(2)F$(
    17)SPC(2)F$(18)SPC(2)F$(19)
    SPC(2)F$(2Ø)          :REM*2Ø7
29Ø PRINTTAB(43)F$(21)SPC(2)F$(
    22)SPC(2)F$(23)SPC(2)F$(24)
    SPC(2)F$(25)          :REM*55
3ØØ SA=S+4:SB=S+5:POKES+21,PEEK
    (S+21)OR4             :REM*93
31Ø XA=153:YA=156:POKESA,XA:POK
    ESB,YA                :REM*146
32Ø BG=INT(RND(.)*2)+1:ONBG GOS
    UB55Ø,56Ø             :REM*85
33Ø IF BM=1 THEN POKE S+21,PEEK
    (S+21)OR1:X=6Ø:POKES+1,Y
                          :REM*172
34Ø IFBM=2 THENPOKE S+21,PEEK(S
    +21)OR2:X=235:POKES+3,Y
                          :REM*27
35Ø POKES+21,PEEK(S+21)OR4:JY=P
    EEK(5632Ø)AND15:FB=PEEK(563
    2Ø)AND16              :REM*24
36Ø IFJY=7THENXA=XA+49:GOSUB138
    Ø:IFXA>251THENXA=251:REM*84
37Ø IFJY=11THENXA=XA-49:GOSUB13
    8Ø:IFXA<55THENXA=55:REM*241
38Ø IFJY=13THENYA=YA+24:GOSUB13
    8Ø:IFYA>2Ø4THENYA=2Ø4
                          :REM*166
39Ø IFJY=14THENYA=YA-24:GOSUB13
    8Ø:IFYA<1Ø8THENYA=1Ø8
                          :REM*113
4ØØ POKESA,XA:POKESB,YA:REM*18Ø
41Ø IFX>24ØTHENPOKES+21,PEEK(S+
    21)AND255-1:POKES,Ø:GOTO32Ø
                          :REM*171
42Ø IFBM=1ANDPC=ØTHENX=X+5:POKE
    S,X                   :REM*2Ø4
43Ø IFBM=1ANDPC=1THENX=X+1Ø:POK
    ES,X                  :REM*95
44Ø IFBM=1ANDPC>1THENX=X+15:POK
    ES,X                  :REM*241
45Ø IFX<6ØTHENPOKES+21,PEEK(S+2
    1)AND255-2:POKES+2,Ø:GOTO32
    Ø                     :REM*1
46Ø IFBM=2ANDPC=ØTHENX=X-5:POKE
    S+2,X                 :REM*71
47Ø IFBM=2ANDPC=1THENX=X-1Ø:POK
    ES+2,X                :REM*2Ø2
48Ø IFBM=2ANDPC>1THENX=X-15:POK
    ES+2,X                :REM*99
49Ø SP=PEEK(S+3Ø)AND4:IF SP=4 T
    HEN GOSUB57Ø          :REM*135
5ØØ IF FB=Ø THEN GOSUB6ØØ
                          :REM*154
51Ø GOTO35Ø               :REM*72
52Ø FORZ=1 TO D-2:ZZ=D/Z:IF ZZ=
    INT(ZZ) THEN XX=N/ZZ:REM*82
53Ø IF XX=INT(XX)THEN F(X)=1:RE
    TURN                  :REM*158
54Ø NEXT Z:CT=CT+1:RETURN
                          :REM*123
55Ø BM=1:GOSUB9ØØ:RETURN
                          :REM*126
56Ø BM=2:GOSUB9ØØ:POKES+4Ø,1:RE
    TURN                  :REM*153
57Ø PRINT"{HOME}"SPC(22)"{2 CRS
    R DNs}GOTCHA!!":POKES+21,Ø:
    GOSUB99Ø              :REM*92
58Ø FORD=1 TO 5ØØ:NEXT:LV=LV-1:
    GOSUB88Ø              :REM*4
59Ø PRINT"{HOME}"SPC(22)"{2 CRS
    R DNs}{8 SPACEs}":POKE(S+3Ø
    ),Ø:RETURN            :REM*242
6ØØ Z=XA+YA               :REM*92
61Ø IFZ=163ANDF(1)=ØTHENPRINTJ$
    SPC(3)P$:F(1)=1:GOTO96Ø
                          :REM*1Ø6
62Ø IFZ=212ANDF(2)=ØTHENPRINTJ$
    SPC(9)P$:F(2)=1:GOTO96Ø
                          :REM*238
63Ø IFZ=261ANDF(3)=ØTHENPRINTJ$
    SPC(15)P$:F(3)=1:GOTO96Ø
                          :REM*171
64Ø IFZ=31ØANDF(4)=ØTHENPRINTJ$
    SPC(21)P$:F(4)=1:GOTO96Ø
                          :REM*93
65Ø IFZ=359ANDF(5)=ØTHENPRINTJ$
    SPC(27)P$:F(5)=1:GOTO96Ø
                          :REM*99
66Ø IFZ=187ANDF(6)=ØTHENPRINTK$
    SPC(3)P$:F(6)=1:GOTO96Ø
                          :REM*67
67Ø IFZ=236ANDF(7)=ØTHENPRINTK$
    SPC(9)P$:F(7)=1:GOTO96Ø
                          :REM*193
68Ø IFZ=285ANDF(8)=ØTHENPRINTK$
    SPC(15)P$:F(8)=1:GOTO96Ø
                          :REM*145
69Ø IFZ=334ANDF(9)=ØTHENPRINTK$
    SPC(21)P$:F(9)=1:GOTO96Ø
                          :REM*184
7ØØ IFZ=383ANDF(1Ø)=ØTHENPRINTK
    $SPC(27)P$:F(1Ø)=1:GOTO96Ø
                          :REM*193
71Ø IFZ=211ANDF(11)=ØTHENPRINTQ
    $SPC(3)P$:F(11)=1:GOTO96Ø
                          :REM*41
72Ø IFZ=26ØANDF(12)=ØTHENPRINTQ
    $SPC(9)P$:F(12)=1:GOTO96Ø
                          :REM*1Ø8
73Ø IFZ=3Ø9ANDF(13)=ØTHENPRINTQ
    $SPC(15)P$:F(13)=1:GOTO96Ø
                          :REM*11
74Ø IFZ=358ANDF(14)=ØTHENPRINTQ
    $SPC(21)P$:F(14)=1:GOTO96Ø
                          :REM*6
75Ø IFZ=4Ø7ANDF(15)=ØTHENPRINTQ
    $SPC(27)P$:F(15)=1:GOTO96Ø
                          :REM*174
76Ø IFZ=235ANDF(16)=ØTHENPRINTM
    $SPC(3)P$:F(16)=1:GOTO96Ø
                          :REM*5
77Ø IFZ=284ANDF(17)=ØTHENPRINTM
    $SPC(9)P$:F(17)=1:GOTO96Ø
                          :REM*186
78Ø IFZ=333ANDF(18)=ØTHENPRINTM
    $SPC(15)P$:F(18)=1:GOTO96Ø
                          :REM*169
79Ø IFZ=382ANDF(19)=ØTHENPRINTM
    $SPC(21)P$:F(19)=1:GOTO96Ø
                          :REM*162
8ØØ IFZ=431ANDF(2Ø)=ØTHENPRINTM
    $SPC(27)P$:F(2Ø)=1:GOTO96Ø
                          :REM*9Ø
81Ø IFZ=259ANDF(21)=ØTHENPRINTO ►
```

RUN it right: **C-64; joystick**

```
    $SPC(3)P$:F(21)=1:GOTO96Ø
                              :REM*93
82Ø IFZ=3Ø8ANDF(22)=ØTHENPRINTO
    $SPC(9)P$:F(22)=1:GOTO96Ø
                              :REM*224
83Ø IFZ=357ANDF(23)=ØTHENPRINTO
    $SPC(15)P$:F(23)=1:GOTO96Ø
                              :REM*245
84Ø IFZ=4Ø6ANDF(24)=ØTHENPRINTO
    $SPC(21)P$:F(24)=1:GOTO96Ø
                              :REM*22Ø
85Ø IFZ=455ANDF(25)=ØTHENPRINTO
    $SPC(27)P$:F(25)=1:GOTO96Ø
                              :REM*27
86Ø PRINT"{HOME}"SPC(25)"{2 CRS
    R DNs}NOPE!":LV=LV-1:GOSUB9
    9Ø:GOSUB88Ø               :REM*151
87Ø FORD=1TO1ØØØ:NEXT:PRINT"{HO
    ME}"SPC(25)"{2 CRSR DNs}{5
    SPACEs}":RETURN           :REM*112
88Ø PRINT"{HOME}"SPC(35)"{9 CRS
    R DNs}"LV:IFLV=ØTHEN1Ø6Ø
                              :REM*236
89Ø RETURN                    :REM*12
9ØØ YY=INT(RND(.)*5)+1:ONYYGOTO
    91Ø,92Ø,93Ø,94Ø,95Ø       :REM*93
91Ø Y=1Ø8:RETURN              :REM*248
92Ø Y=132:RETURN              :REM*224
93Ø Y=156:RETURN               :REM*31
94Ø Y=18Ø:RETURN                :REM*7
95Ø Y=2Ø4:RETURN               :REM*6
96Ø SR=SR+5:GOSUB1Ø3Ø:PRINT"{HO
    ME}"SPC(35)"{17 CRSR DNs}"S
    R                         :REM*64
97Ø CU=CU+1:IFCU=CTTHENPC=PC+1:
    GOTO128Ø                  :REM*219
98Ø RETURN                    :REM*1Ø2
99Ø POKE53281,2:POKESN+5,64:POK
    ESN+6,136:POKESN+1,8:POKESN
    ,97:POKESN+4,33           :REM*226
1ØØØ FORL=1TO1ØØØ:NEXT:POKESN+4
    ,32:FORL=1TO5Ø:NEXT:POKESN
    +1,4:POKESN,48            :REM*1Ø7
1Ø1Ø POKESN+4,33:FORL=1TO1ØØØ:N
    EXT:POKESN+4,32:POKE53281,
    7                         :REM*192
1Ø2Ø RETURN                   :REM*142
1Ø3Ø POKESN+5,64:POKESN+6,136:P
    OKESN+1,28:POKESN,49:POKES
    N+4,17                    :REM*243
1Ø4Ø FORL=1TO1ØØ:NEXT:POKESN+4,
    16:FORL=1TO5Ø:NEXT:POKESN+
    1,56:POKESN,99            :REM*66
1Ø5Ø POKESN+4,17:FORL=1TO15Ø:NE
    XT:POKESN+4,16:RETURN
                              :REM*136
1Ø6Ø POKES+21,PEEK(S+21)AND255-
    7:SR=Ø:PC=Ø:CT=Ø:CU=Ø:POKE
    S,Ø:POKES+2,Ø             :REM*31
1Ø7Ø POKESA,Ø:POKESB,Ø:PRINT"{H
    OME}{22 CRSR DNs}"SPC(15)"
    GAME OVER"                :REM*145
1Ø8Ø PRINT"{3 CRSR RTs}WOULD YO
    U LIKE TO TRY AGAIN? (Y/N)
                              :REM*164
1Ø9Ø GOSUB126Ø:IFI$="Y"THENPRIN
    T"{SHFT CLR}":GOTO3Ø
                              :REM*19
11ØØ IF I$<>"N"THEN1Ø9Ø :REM*22
111Ø END                      :REM*21Ø
112Ø POKE5328Ø,1Ø:POKE53281,7:P
    RINT"{SHFT CLR}{COMD 3}{CR
    SR DN}"SPC(9)"{COMD +}{4 S
    PACEs}{COMD +}{5 SPACEs}{C
    OMD +}{5 SPACEs}{4 COMD +s
    }";                       :REM*188
113Ø PRINTSPC(19)"{COMD +}{3 SP
    ACEs}{COMD +}{6 SPACEs}{CO
    MD +}{5 SPACEs}{COMD +}"SP
    C(22)"{COMD +}{2 SPACEs}{C
    OMD +}{7 SPACEs}{COMD +}{5
     SPACEs}{COMD +}";        :REM*17
114Ø PRINTSPC(22)"{COMD +} {COM
    D +}{8 SPACEs}{COMD +}{5 S
    PACEs}{COMD +}"SPC(22)"{2
    COMD +s}{9 SPACEs}{COMD +}
    {5 SPACEs}{4 COMD +s}";
                              :REM*253
115Ø PRINTSPC(19)"{COMD +} {COM
    D +}{8 SPACEs}{COMD +}{8 S
```



Find the fractions in simplest form.

```
    PACEs}{COMD +}"SPC(19)"{CO
    MD +}{2 SPACEs}{COMD +}{7
    SPACEs}{COMD +}{8 SPACEs}{
    COMD +}";                 :REM*3
116Ø PRINTSPC(19)"{COMD +}{3 SP
    ACEs}{COMD +}{6 SPACEs}{CO
    MD +}{8 SPACEs}{COMD +}"SP
    C(19)"{COMD +}{4 SPACEs}{C
    OMD +} {SHFT Q}{3 SPACEs}{
    COMD +} {SHFT Q}{3 SPACEs}
    {4 COMD +s} {SHFT Q}"
                              :REM*237
117Ø PRINT:PRINTSPC(12)"{CTRL 7
    }(KEEP IT SIMPLE)" :REM*57
118Ø PRINT:PRINT"{COMD 5}{2 SPA
    CEs}MOVE AROUND THE GRID,
    USING A JOYSTICK IN PORT 2
    , ";                      :REM*139
119Ø PRINT"PRESS THE FIRE BUTTO
    N WHEN{3 SPACEs}";:REM*183
12ØØ PRINT"YOU{2 SPACEs}ARE{2 S
    PACEs}ON{2 SPACEs}A{2 SPAC
    Es}FRACTION{2 SPACEs}THAT
    IS IN{3 SPACEs}SIMPLEST FO
    RM.";                     :REM*2Ø3
121Ø PRINT" YOU START WITH 3 LI
    VES{3 SPACEs}BUT LOSE 1 EA
    CH TIME YOU HIT FIRE ON";
                              :REM*123
122Ø PRINT" A{2 SPACEs}FRACTION
    {2 SPACEs}THAT{2 SPACEs}IS
    {2 SPACEs}NOT SIMPLE OR ON
     A{2 SPACEs}BLANK SPACE.";
                              :REM*1ØØ
123Ø PRINT" YOU{2 SPACEs}ALSO{3
     SPACEs}LOSE A LIFE IF YOU
     ARE CAUGHT BY THE";
                              :REM*212
124Ø PRINT"{CTRL 1} SIMPLETON"
                              :REM*119
125Ø PRINT:PRINTSPC(1Ø)"{COMD 5
    }HIT ANY KEY TO BEGIN"
                              :REM*52
126Ø GETI$:IFI$=""THEN126Ø
                              :REM*159
127Ø RETURN                   :REM*129
128Ø POKES+21,PEEK(S+21)AND255-
    7                         :REM*81
129Ø POKESN+5,19Ø:POKESN+6,89:P
    OKESN+1,34:POKESN,75:POKES
    N+4,17:FORT=1TO25Ø:REM*16Ø
13ØØ NEXT:POKESN+1,57:POKESN,17
    2:FORT=1TO25Ø:NEXT:POKESN+
    1,45:POKESN,198           :REM*247
131Ø FORT=1TO25Ø:NEXT:POKESN+1,
    68:POKESN,149:FORT=1TO5ØØ:
    NEXT                      :REM*155
132Ø POKESN+1,57:POKESN,172:FOR
    T=1TO25Ø:NEXT             :REM*6
133Ø POKESN+1,68:POKESN,149:FOR
    T=1TO5ØØ:NEXT:POKESN+4,16:
    POKES,Ø:POKES+2,Ø         :REM*19
134Ø PRINT"{SHFT CLR}{5 CRSR DN
    s}{11 CRSR RTs}CONGRATULAT
    IONS!!!                   :REM*112
135Ø PRINT"{CRSR DN}{9 CRSR RTs
    }YOU FOUND ALL OF THEM
                              :REM*17
136Ø PRINT"{3 CRSR DNs}{8 CRSR
    RTs}HIT ANY KEY TO CONTINU
    E"                        :REM*2Ø9
137Ø PRINT"{3 CRSR DNs}{7 CRSR
    RTs}YOUR CURRENT SCORE IS
    "SR:GOSUB126Ø:GOTO9Ø
                              :REM*145
138Ø POKESN+4,129:POKESN+5,15:P
    OKESN+1,125:POKESN,255:FOR
    F=1TO25:NEXTF             :REM*17
139Ø POKESN+4,Ø:RETURN :REM*115
14ØØ DATAØØØ,ØØØ,ØØØ,ØØ1,Ø16,ØØ
    Ø,ØØØ,224,ØØØ,ØØ1,2Ø8,ØØØ,
    ØØ3,248,ØØØ,ØØ1           :REM*239
141Ø DATA24Ø,ØØØ,ØØØ,224,ØØ8,ØØ
    Ø,Ø64,ØØ4,ØØ7,255,254,ØØ2,
    Ø84,ØØ4,ØØ1,Ø72           :REM*49
142Ø DATAØØ8,ØØØ,192,ØØØ,ØØØ,Ø6
    4,ØØØ,ØØØ,Ø64,ØØØ,ØØØ,16Ø,
    ØØØ,Ø49,Ø16,ØØØ           :REM*95
143Ø DATAØ42,ØØ8,ØØØ,Ø36,ØØ8,ØØ
    Ø,ØØØ,Ø16,ØØØ,ØØØ,Ø32,ØØØ,
    ØØØ,Ø56,ØØØ,ØØØ           :REM*64
144Ø DATAØØØ,ØØØ,ØØØ,ØØ8,128,ØØ
    Ø,ØØ7,ØØØ,ØØØ,Ø11,128,ØØØ,
    Ø31,192,ØØØ,Ø15,128
                              :REM*23Ø
145Ø DATAØØØ,Ø07,ØØØ,Ø16,ØØ2,ØØ
    Ø,Ø32,255,224,127,Ø42,Ø64,
    Ø32,Ø18,128,Ø16,ØØ3:REM*7Ø
146Ø DATAØØØ,ØØØ,ØØ2,ØØØ,ØØØ,ØØ
    2,ØØØ,ØØØ,ØØ5,ØØØ,ØØØ,ØØØ,
    14Ø,ØØØ,Ø16,ØØ4,ØØØ
                              :REM*125
147Ø DATAØ16,Ø36,ØØØ,ØØ8,ØØØ,ØØ
    Ø,ØØ4,ØØØ,ØØØ,Ø28,ØØØ,ØØØ,
    ØØØ,ØØØ,126,ØØØ,ØØ1
                              :REM*2Ø9
148Ø DATA255,128,Ø07,255,224,Ø3
    1,255,248,Ø6Ø,255,Ø6Ø,124,
    255,Ø62,124,255,Ø62:REM*74
149Ø DATA252,231,Ø63,252,231,Ø6
    3,252,231,Ø63,255,231,255,
    239,129,247,119,255
                              :REM*2Ø1
15ØØ DATA238,Ø59,255,22Ø,Ø28,ØØ
    Ø,Ø56,Ø14,ØØØ,112,ØØ3,255,
    192,ØØØ,255,Ø48,ØØØ
                              :REM*12Ø
151Ø DATAØ6Ø,Ø64,ØØ1,255,128,ØØ
    2,126,ØØØ,255     :REM*25Ø
```

■

The Producer, the Wizard and the C-64

These two video products will let you use your 64 to add sparkle to your home movies and organize your tape collection.

By JOHN RYAN

Remember your first video camera? You filmed anything that moved, and even things that didn't (sleeping dogs, your new house, your feet). Now you're stuck with a bunch of dull videos that no one in the family (much less outside the family) cares to look at—even if you can find the one you want in that huge pile of tapes stacked next to the TV.

Never fear! These two C-64 products, Home Video Producer and Video Wizard, will jazz up your videos and help you keep them organized.

Add Zip to Your Home Videos

How? By adding titles and graphics sequences to your home videos with **Home Video Producer** (HVP) from Epyx Software. While this C-64 program won't make you the next Cecil B. DeMille, its graphics, text and special-effects capabilities can give your videos that creative nudge.

HVP is a video titling and special-effects construction kit. With its stock graphics and video fonts, anyone with a video cassette recorder or camcorder can easily add titles, graphics and animated sequences to videotapes.

The graphics sequences are created by the 16 available frames, using a variation of "page-flipping," and they can be fairly sophisticated, depending on how much work you want to put into them. Once graphics and text are added, HVP rapidly flips through each frame, displaying the graphics or text on the screen to achieve a wide variety of effects for you to record.

HVP is not a special-effects generator, although it can employ special effects in presenting your graphics. It's also not a titler, per se, although you can use it to produce titles for your videos. What HVP does best is generate static or semianimated graphics to record on videos before or after live scenes.

The program is not copy protected, so

Add a professional touch to your home videos with Epyx's Home Video Producer.

1581 users can transfer the program to 3½-inch format.

Features Included

Home Video Producer is completely menu-driven and easy to use. It's quick and responsive (occasional disk accesses aside), and almost all its features can be accessed with the cursor keys. Sixteen video frames are available for constructing your graphics or title sequences; four of them are shown on the monitor screen at once. Think of these as movie frames you can fill as you wish.

You can't edit or create graphics with HVP, but the program provides graphics to fit most occasions that would be shot with a home camcorder; you just decide which images to use and how they'll appear on tape.

The first frame is usually reserved for adding a backdrop or border, which will appear in all succeeding frames of your video. You can position a graphics image anywhere within a frame, as well as reduce or enlarge the frame area. Because a frame may contain only one graphics image, multiple effects are not possible.

You must also decide how to display frames from a special-effects menu. Special icons are available for tearing, wiping, spiraling and scrolling. You can get basic animation by scrolling an image around the screen at various rates.

The program lets you delete, cut and paste frames, and it allows you to link video files to produce sequences longer than 16 frames. It also has ten movie templates, running the gamut of vacation, birthday and sports themes, in case you need to produce a sequence in a hurry. You just fill in the blanks and put the sequence on tape.

For creating titles and adding text to graphics, HVP offers 14 different fonts. The procedure for placing text in frames is the same as for graphics. Likewise, you can scroll the text (one line at a time) and set the overall color.

Once you've created and saved a sequence, you're ready to record it. Just spot your tape where you want to insert the sequence, then select the Play Movie option. The program will cue you with tones when it's both time to begin recording and the recording is done.

Missing Features

You can't use Home Video Producer to superimpose graphics on live video. For that you'd need a *genlock*, a device that locks the computer's internal sync generator to synchronization signals from the incoming video source, and as far as I know there are no genlocks for the C-64.

A number of handy features are missing from HVP. Provisions could have been added for creating and editing graphics and for rolling credit sequences. It would also be helpful if the program had a "slate" (for noting information about live video sequences, such as time and date), a countdown timer for cueing recording sessions on and off (especially because the end-of-session tones can get recorded on the tape if the audio is connected) and a simulated fade to black (although you can add a black wipe to the last frame). Finally, the program could have offered color bars for adjust- ►

ing the hue and color of a graphics image before final taping.

While the video quality of recorded sequences is fair (about what you'd expect coming directly off a computer video source), they do suffer from significant smearing and dot crawl. Smearing occurs with highly saturated colors in NTSC composite video. Dot crawl is an annoying phenomenon that appears most often when lines or graphics are one or two pixels wide or when two contrasting colors appear adjacent on the screen. These problems are quite noticeable and they are difficult to cure, because you can't adjust the saturation of individual colors on the C-64.

Even more troublesome is the background noise that gets recorded with the sequences that you create. The HVP manual says you can reduce this noise by connecting the audio-in end of the cable and leaving the other end unplugged, but this didn't do much for me when I tried it.

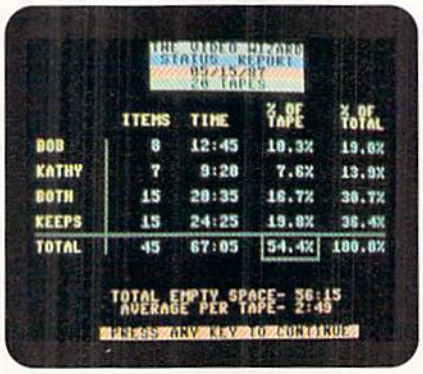
Home Video Producer is easy to use, intuitive and a lot of fun. While it lacks some features, it certainly can help spice up amateur videos.

Keep Track of Your Videos

Whether you record your own videotapes or just buy commercial ones, IntraCorp's **Video Wizard**, for the C-64, is just the ticket for keeping your collection organized.

We're not talking about a simple program that just stores names; we're talking about a comprehensive database that manages information about a collection right down to the time left on a particular tape.

Video Wizard is a memory-based data management system that's completely menu-driven and painless to use. By following the sample database on disk,


STATUS REPORT
ITEMS TIME % OF TAPE % OF TOTAL
BOB 8 12:45 10.3% 19.8%
KATHY 7 9:20 7.6% 13.9%
BOTH 15 20:35 16.7% 30.7%
KEEPS 15 24:25 19.8% 36.4%
TOTAL 45 67:05 54.4% 100.0%
TOTAL EMPTY SPACE- 56:15
AVERAGE PER TAPE- 2:49

Video Wizard is an enchanting program to help you organize your video collection.

you'll become familiar with almost every feature of this program, without even having to open the manual.

Features Galore

At its most basic, Video Wizard lists tapes alphabetically or in order of length (from shortest to longest). It lets you set up key words, such as Comedy or Drama, and then choose them to display or print specific categories of entries. The listings contain not only tape titles, but also the length of each title and even the elapsed counter values of the program. If your VCR uses real-time counters, then Video Wizard will do the translation for you.

The program also keeps automatic track of time remaining on a tape—a boon if you ever want to find a tape quickly when an important show is coming on. The find-space feature will even ask how much time you need on the tape, then hunt through your entire collection to find it. If the search is unsuccessful, you'll see the nearest match.

Because Video Wizard is a database, it offers normal database features, such as adding, deleting, searching and updating. All these features are menu-driven, and text entry is easy. You can even assign the computer's function keys to enter oft-needed information, such as tape length and television show name.

Video Wizard provides a wealth of other options, too. One is a print routine for making tape labels (blanks are included). Another is a status report that gives information at a glance about your collection, such as number of tapes in each category, total time recorded and the percentage of tape used for the different categories. You can even establish a Keeper category for tapes you'll treasure forever.

Unusual for this type of program is the titling feature, a simple line editor that automatically centers up to 23 lines of text on the screen. You can choose the border and screen colors and set the type to any of the 16 Commodore colors. It's also possible to manually flip through up to five pages of text, or have the computer do it for you over a specific amount of time.

Video Wizard takes a no-nonsense approach to maintaining a video collection. The program is fairly bulletproof, and so easy to use you'll probably keep it as long as you keep your videotapes. ■

John Ryan is a contributing editor to RUN *and a video buff.*

Addresses and Prices

Home Video Producer
Epyx Software
600 Allerton St.
Redwood City, CA 94063
$49.95

The Video Wizard
IntraCorp
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Connecting Your Computer to Your VCR

Hooking up a VCR to a computer system can be straightforward or problematic, depending on the monitor you have. Here are some tips for avoiding the pitfalls I experienced.

Your Commodore's video signal must be rerouted to the VCR instead of to the monitor, and, if the VCR's video input takes a different kind of connector than the monitor's input, you'll need a different cable than the one you use with the monitor. A monitor like my 1902A takes a 6-pin DIN connector, while most VCR line inputs need an RCA pin jack (or BNC connector, in some cases).

The cure is a cable, usually referred to as 40-column-composite, with an 8-pin DIN connector on the computer end and an RCA pin plug on the VCR end. Some of these cables have three wires, coded red, yellow and white for the lumina, chroma and audio signals. Others have two output connections, one for composite video and the other for audio. If you don't own a two-line composite cable, buy one. With a three-line cable you'll get only monochrome images (from the chroma output) on your monitor—although you can still record in color.

Once you connect the computer to the VCR input, you'll need another RCA cable (or two, if you want audio) to connect from the VCR output to the monitor's CVBS inputs (female RCA).

If you own a high-end or older VCR that needs a BNC connector, you can purchase BNC-to-RCA adapters at Radio Shack. The least expensive cost about $2, but I'd suggest a gold-plated adapter for about $5 to increase the fidelity of the video signal. —*JR*

Classy Graphics

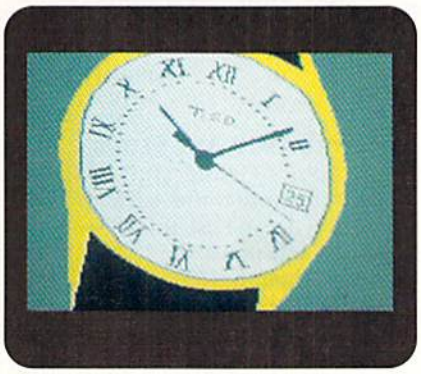
This C-128 utility will let you jazz up your Basic 7.0 programs with Animation Station graphics.

By MICHAEL FALCO

The C-128 has many fine features, not the least being Basic 7.0 with its powerful graphics commands. To complement these commands and to create background pictures for my C-128 programs, I wanted to use my Animation Station software and tablet, which make drawing on the computer screen as easy as drawing on paper.

I couldn't find a utility program that would convert the Animation Station graphics to Basic 7.0 format, so I wrote Split Graphics to fill the void. It can be used for any kind of graphics your programs might need.

Type in Split Graphics from Listing 1, using *RUN*'s Checksum program on page 61 to catch any typing errors. To use Split Graphics, first create and save a graphics image using the standard Animation Station procedures. Then return to 128 mode, DLOAD and RUN the program. At the prompt, enter the complete filename of your graphics image (including the PI. prefix) and press RETURN.



Time to be creative with Classy Graphics.

Split Graphics will create three separate files from the single original and give them three new prefixes: SCRN, VMTX and CRAM. The first file contains 8K of screen memory, the second 1K of video matrix, and the third 1K of color RAM. Next, using BLOAD, the program will load these files into appropriate memory areas for display and verification. When you press the RETURN key, it will end.

To use your picture in a Basic 7.0 program, just BLOAD the three files into the appropriate areas of memory and, as shown in example Listing 2, initialize the various background colors and hardware devices. (*Note: Listing 2 is just an example; this code is already included in Split Graphics, starting at line number 190.*)

Now, with the quality of Animation Station graphics available in Basic 7.0, you can create programs with a truly professional look. R

Michael Falco is a manufacturing engineer who enjoys programming on his C-128.

Listing 1. Split Graphics program. (Also available on the September/October ReRUN disk. To order, call 800-343-0728.)

```
10 REM SPLIT GRAPHIC - MICHAEL
   FALCO                    :REM*197
20 BANK 1: SCNCLR           :REM*30
30 PRINT"{7 CRSR DNs}"      :REM*28
40 PRINT "SPLIT GRAPHIC PROGRAM
   "                        :REM*37
50 PRINT " ENTER ANIMATION STAT
   ION FILE NAME"           :REM*236
60 PRINT"{CRSR DN}"         :REM*213
70 INPUT A$                 :REM*184
80 FAST:                    :REM*68
90 BLOAD (A$),P32768        :REM*195
100 REM DELETE PI.          :REM*132
110 A$ = MID$(A$,4,13)      :REM*235
120 REM SAVE 8K OF SCREEN MEMOR
    Y. BLOAD TO 8192 TO DISPLAY
    .                       :REM*134
130 BSAVE ("SCRN."+ A$),P32768
    TO P40769               :REM*254
140 REM SAVE 1K OF VIDEO MATRIX
    . BLOAD TO 7168 TO DISPLAY.
                            :REM*177
150 BSAVE ("VMTX." +A$),P40960
    TO P41961               :REM*73
160 REM SAVE 1K OF COLOR RAM, B
    LOAD TO 55296 TO DISPLAY.
                            :REM*63
170 BSAVE ("CRAM." +A$),P41984
    TO P42985               :REM*22
180 SCNCLR                  :REM*157
190 REM DISPLAY PICTURE     :REM*19
200 SCNCLR: COLOR 4,1       :REM*172
210 GRAPHIC 3,1: GRAPHIC 0
                            :REM*15
220 BANK 0                  :REM*108
230 BLOAD ("VMTX." + A$), P7168
                            :REM*200
240 BLOAD ("SCRN." + A$), P8192
                            :REM*29
250 REM FORCE VIC COLOR RAM TO
    LOWER 64K               :REM*43
260 POKE 0,44: POKE 1,119
                            :REM*134
270 REM COLOR RAM DISPLAYED FRO
    M BANK 15               :REM*51
280 BANK 15                 :REM*130
290 BLOAD ("CRAM." + A$), P5529
    6                       :REM*66
300 GRAPHIC 3               :REM*114
310 SLOW                    :REM*130
320 REM WAIT FOR CARRIAGE RETUR
    N                       :REM*178
330 INPUT A$                :REM*191
340 GRAPHIC 0               :REM*144
350 END                     :REM*223
```

Listing 2. An example showing how to load graphics files into memory and how to initialize colors and devices.

```
10 SCNCLR: COLOR 4,1
20 GRAPHIC 3,1: GRAPHIC 0
30 BANK 0
40 BLOAD "VMTX.{filename}", P7168
50 BLOAD "SCRN.{filename}", P8192
60 POKE 0,44: POKE 1,119
70 BANK 15
80 BLOAD "CRAM.{filename}", P55296
90 GRAPHIC 3
```

RUN it right: **C-128**

ProTips

Great advice about various word processors, disk drive alignment, and using MS-DOS clip art on the C-64/128.

By JANICE GREAVES

1541/1571 Drive Alignment: This program is very useful for fixing disk drive alignment problems, but the documentation doesn't give the best aligning method. First, follow the instructions to expose the stepper motor and loosen the screws. Instead of twisting the motor, alternately hold the screwdriver against the top and bottom mounting flanges and very gently tap its handle with a small wooden mallet or other light tool. Do this until the alignment is correct, then tighten the screws. You'll find that this method is much more precise.

—Henning Vahlenkamp
Matawan, NJ

WordWriter 5: Here's a trick to give WordWriter 5 a Gee-Wiz interface in ASCII mode, so you can use all the features of your printer. Save this program as Boot on your disk, then load it instead of the normal WW boot program.

```
10 OPEN4,4,25:PRINT#4,"LOCK":
   CLOSE4
20 PRINT"{CLR}NOW LOADING WORD
   WRITER 5... {5/CRSR↓}"
30 PRINT"{CTRL 7}LOAD"CHR$(34)
   "WW"CHR$(34)",8,1"
40 PRINT"{4/CRSR↓}RUN":PRINT"{9/
   CRSR↑}"
50 POKE 631,13:POKE 632,13:POKE
   198,2:END
```

Now WW5 will boot in ASCII mode with the fastloader installed.

—Michael Maki
Cloquet, MN

GEOS 1.3 and the Commodore MPS-803: When I upgraded my GEOS to version 1.3 (using the kit provided with the Commodore 1351 mouse), the MPS-803 printer driver in version 1.2 was replaced with the MPS-1000 printer driver. But when I went to print a geoWrite file using a font from *RUN*'s GEOS Companion disk, the printer refused to print correctly.

To fix the problem, I trashed the MPS-1000 driver and replaced it with a copy of the old MPS-803 driver (from the backup copy of GEOS 1.2). Also, to avoid having to choose the MPS-803 driver every time I boot up, I placed the MPS-803 driver as the first printer driver on my boot disk.

—Ryan Hidalgo
Garnerville, NY

Advanced OCP Art Studio, V1.4: In "Graphics Galore"(July '88), Lou Wallace stated that the Advanced OCP Art Studio doesn't use the 1351 mouse. There is a way to use the 1351 with that program, though. Here's how:

With the mouse plugged into control port 1, power up while holding the right-hand mouse button down (Joystick mode). Next, load the Art Studio program as usual. When the program has loaded and the top menu bar appears, press COMMODORE/space bar until the top-right input icon changes to the mouse shape. Your mouse will now run like a Swiss watch!

—Robert Borch
Brooklyn, NY

Clip Art Conversion: My father, a C-64/128 user, and I, an IBM-compatible user, wanted to share the public domain clip art we had collected. We finally discovered a workable method that didn't require purchasing any extra hardware—not even a modem.

To go from MS-DOS to Commodore, I use IConvert (a shareware program) to convert my clip art into Commodore Print Shop, Printmaster, or Doodle! format. My dad then uses Big Blue Reader to transfer the files from my MS-DOS disks to Commodore disks.

The graphics files are now on Commodore disks, but not yet in the correct format, because Big Blue Reader saves them as sequential (SEQ) files and they need to be in program (PRG) format. My dad remedied this problem by first scratching the files and then unscratching them as PRG files using the unscratch utility found on the disk that comes with Commodore disk drives.

Having done this, he can use the IBM clip art with Commodore software.

Going from Commodore to MS-DOS is even easier. My dad merely uses a conversion program to convert his clip art files into Print Shop, Print Master, or Doodle! format, and then uses Big Blue Reader to transfer them to MS-DOS disks. I then use IConvert to convert the files into a proper MS-DOS format. [*For more on this subject, see the article sidebar on page 22—Editors.*]

—Allie Hunter
Windsor, Newfoundland

Word Writer 5: Timing *is* everything! Dayton Livingston's tip on Paperclip III in the January/February '91 issue gave me an idea. Then, Roy Kannady's piece on REMs in Superbase really clinched it. This is the result:

When using WW 5 for letters, records, and so forth, I occasionally like to enter a REMark (usually a reminder to myself) so that it shows on the screen but doesn't print. The method is simple: A checkmarked line doesn't print out. It does only one specific job, determined by the letter that immediately follows the check (with no space). So, if I want a nonprinting, nonfunctional reminder statement, I enter a checkmark, followed by a space, and then the statement itself.

—Fred Eckmann
Las Vegas, NV

Word Writer 128: Word Writer 128 users with Commodore's 1750 REU can use it as a RAMdisk with Commodore's RAMDOS utility. Simply load RAMDOS, then boot WW using the boot command. Configure your RAMdisk under the Disk Commands menu as you would any other drive. JiffyDOS users may copy the WW dictionary to the RAMdisk prior to booting WW and thus speed up spell-checking by a factor of two or three —helpful when spell-checking longer documents.

Commodore's Filecopy program will also copy the dictionary to the RAMdisk under RAMDOS, for those not equipped

with JiffyDOS. Some other file-copy utilities might work as well, but would have to be tried on an individual basis.

—Peter Fiorentino
Jamaica, NY

Word Writer 128: I've found that leaving joysticks plugged into control port 2 of the C-128 does not interfere with Word Writer 128 unless the autofire option is selected on the Quick Shot II joystick. So if your keyboard isn't responding properly, check your joystick options.

—Glen Young
Renton, WA

Write Now and Fleet System 4: My first word processor was the Write Now program on a C-64. Write Now is a good program and I created a lot of text with it. I'm a playwright, so the files were highly formatted.

Write Now's printer codes and returns are displayed as reversed characters, and when I upgraded to a C-128 and Fleet System 4, I found that, try as I might, I couldn't eliminate the reversed characters when I loaded Write Now texts into Fleet System. Search and Replace just wouldn't handle reversed characters, and I never found a conversion routine that worked . . . until now.

Recently I've found that if I boot WN text into FS-4 and use the Range function in the following manner, I can correct the reversed text:

1. Boot your WN text into FS-4.
2. Working from the top of the text, activate the Range function using Line mode and cursor down to line 100.
3. Hit RETURN to save the range.
4. Go back to the text and, starting at line 101, save another 100 lines in the same manner. Do this until you've done all the text you want to convert.
5. Erase the text and load the first range.
6. Use Insert mode to load the other saved ranges in proper order.
7. All previously reversed characters are now "unreversed."
8. Any minor formatting problems can be cleaned up with Search/Replace.
9. You now have an FS-4 file without any of Write Now's reversed characters.

—Jack Fournier
Venice, FL

Write Stuff and Speed Script: Version 2 of Write Stuff allows you to create graphics using the characters found on the front of your keys. The COMMODORE key and a letter give you the left-hand characters, if you disable the keyboard macros (CONTROL/COMMODORE/K). If you set your secondary address as 0 (CONTROL, 2, SA0), you can use the right-hand characters.

Speed Script uses COMMODORE and the various keys for the left-hand shapes; the right-hand shapes use CONTROL/3 and the appropriate ASCII value.

For both word processors, the right-hand figures will show on-screen as letters or numerals, but will print to paper or screen as shapes.

—John Elliott
Truro, Nova Scotia

Final Cartridge III: There are two undocumented commands in the menu of Final Cartridge III, Replace and Help.

The Replace command makes it possible to replace text or Basic commands throughout the document. Its syntax is:

```
REPLACE"FC","FINAL CARTRIDGE"
```

in which FC is replaced by the words

```
FINAL CARTRIDGE
```

The Help command can be accessed only from the basic menu. If an error is detected when a program is run, HELP will display the line on which the error has occurred.

—John Elliott

Okidata 120 Update: I'd like to offer an addition to the tip submitted by Jeff Waters that appeared in this column in May/June '91 regarding near-letter-quality (NLQ) on the Okidata 120.

The earlier versions of the 120 did not have the NLQ feature, so holding down the formfeed button while powering up would not lead to NLQ printing. However, owners of those earlier versions can get a PROM from Okidata that will upgrade the unit to NLQ. The owner needs only to remove the old PROM and replace it with the new one.

—John Casey
Salem, OR ■

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128 Mode

If you program on your C-128, don't forget about 64 mode. This routine gives it a numeric keypad and cursor keys.

By MARK JORDAN

RECENTLY I DID something highly distasteful with my C-128: I went over to 64 mode to do some programming. I was working on a machine language project, so I really didn't mind leaving Basic 7.0 commands behind. I wasn't even that bothered by the lack of editing commands in 64 mode, because I have a utility that gives me some of them back.

What really hurt was leaving behind my extended keyboard. I needed to type in a lot of numbers, and, oh what agony to tap on the C-128's numeric keypad and watch it play dumb. So, I decided it was time to do something about it.

The program in Listing 1, called Keypad, is a short machine language routine that awakens both the keypad and the top-row cursor keys in 64 mode. Plus, it gives most of the other mute keys in the top row something to say.

Preliminaries

Since the program takes the form of a Basic loader, there are a lot of numbers to type in. Of course, Keypad's whole point is to make typing numbers in 64 mode easier, but until you've got it up and running it won't do you any good. I suggest you type the program in 128 mode, save it, then go over to 64 mode to load and run it for the first time. That way you can use the 128 mode keypad for input. Be sure to use *RUN*'s Checksum program on page 61 to catch any typing mistakes you may make.

You need to put a work disk in the drive before running Keypad, because the program saves a binary version of itself to disk. This binary version is just the actual machine code, which loads into memory anytime without needing to poke numbers into place. You can save the binary version to as many disks as you want by putting each disk in the drive and running the Basic loader program again.

Once the binary version has been saved to disk, load it into memory with the following statement:

```
LOAD "KEYPAD.ML",8,1
```

Keypad is located at memory address 49152 ($C000), so you have to remember to SYS 49152 to get it up and working. Anytime you reset your computer after starting the program, you need to reinstall it with SYS 49152.

I designed Keypad for use in Direct (programming) mode rather than while a program is running, but you can use it within a program if you wish. The best way is to place the following two lines at the beginning of the program:

```
10 IF A=0 THEN A=1:LOAD "KEYPAD.
   ML",8,1
20 SYS 49152
```

Definitions

Besides bringing the keypad and cursor keys to life, this program gives the following keys new identities:

Escape—toggles Quote mode on and off.

Tab—jumps the cursor eight spaces to the right.

Alt—toggles between upper- and lowercase mode more easily than SHIFT/COMMODORE does.

Help—clears the screen from the cursor downward.

Line feed—jumps the cursor to the bottom of the screen.

No scroll—pauses listings (or anything else). Press any other key to continue.

Technicalities

If you have a technical bent and are wondering how Keypad works, the key ingredient is a new register in the VIC (8564) chip that communicates with memory location 53295 ($D02F). On the original C-64, this location wasn't connected to the VIC-II chip, so reading or writing to it was useless. Now it's connected for the sole purpose of reading the additional keys on the C-128's keyboard.

The reason the Commodore engineers didn't implement this register in 64 mode from the start is because they were trying to create a virtual 64. That's a pity, though, because the register doesn't affect C-64 programs at all. I suppose it's possible that some C-64 software was written that tapped into location 53295 and would thus be corrupted, but it's unlikely.

You may also wonder why you can't write a program in 128 mode, enjoying its attributes, then save the program, switch over to 64 mode, load it and run it . . . as I suggested you do for Keypad. You can do this, but there are a couple of problems.

The most dangerous problem is what the C-128 does with certain letter combinations that are otherwise harmless in 64 mode. It's easy to forget that DO, CHAR and other letter combinations are interpreted by the C-128 as keywords. Therefore, if you accidentally use one of them as a variable name, when you cross over to 64 mode it won't look (or act) the same at all.

The most annoying problem is that you can't enjoy Basic for what it's best at: the quick test. Instead of typing in code, running it, fixing it, then running it again, you're forced to do all your editing in 128 mode, save your program before exiting to 64 mode, test it, reenter 128 mode, reload the program, and so on. You might as well be programming in C.

Surprising as it seems, there are several reasons why you still might want to write programs in 64 mode occasionally, the C-128's giftedness notwithstanding. Perhaps the most compelling is to publish your program. The market for C-64 software is much more active than for the C-128.

A second reason is that Basic programs written in 64 mode actually run faster. This is because the C-64's version of Basic (2.0) has less overhead to slow it down (simple translation: it has fewer commands to look up).

A third reason is program portability to other computer types. Basic 2.0 is so rudimentary, in many cases it can be converted to other systems with few modifi-

cations . . . unless the program uses a lot of pokes and peeks.

Programming in the 64 mode of a C-128 can be aggravating for the experienced C-128 programmer. However, it also has its benefits and advantages. Strange as it may seem, at times 64 mode on the 128 is a great place to be. R

In addition to programming and writing RUN*'s 128 Mode column and various articles, Mark Jordan teaches high school English in Ligonier, Indiana.*

Listing 1. Keypad program. (Available on the September/October ReRUN disk. To order, call 800-343-0728.)

```
10 FORT=0TO271:READ A:Z=Z+A
                        :REM*240
20 POKE49152+T,A :NEXT :REM*177
30 IFZ<>34840THENPRINT"{SHFT CL
   R}ERROR IN DATA!{2 SPACEs}RE
   -CHECK."             :REM*187
40 SYS49152             :REM*214
50 PRINT"{SHFT CLR}INSTALLED. N
   OW PLACE WORKDISK IN DRIVE A
   ND PRESS RETURN."    :REM*140
60 GETA$:IFA$<>CHR$(13)THEN60
                        :REM*129
70 OPEN1,8,1,"KEYPAD.ML"
                        :REM*249
80 POKE780,251:POKE251,0:POKE25
   2,192                :REM*236
90 POKE781,16:POKE782,193
                        :REM*162
100 SYS 65496:CLOSE1    :REM*128
110 DATA 120,169,13,141,20,3,16
    9,192,141,21,3,88,96,169,24
    8,141,47,208,169    :REM*239
120 DATA 255,141,0,220,205,1,22
    0,208,10,141,47,208,74,141,
    0,220,76,49,234     :REM*162
130 DATA 160,0,140,141,2,169,25
    1,141,47,208,162,8,173,1,22
    0,205,1,220,208     :REM*177
140 DATA 248,74,144,9,200,202,2
    08,249,110,47,208,176,234,1
    85,247,192,48,26    :REM*45
150 DATA 201,65,144,29,240,40,2
    01,66,240,52,201,67,240,68,
    201,68,240,71       :REM*25
160 DATA 201,69,240,80,201,70,2
    40,106,162,1,142,141,2,41,1
    27,133,203,169      :REM*23
170 DATA 255,141,47,208,32,72,2
    35,76,126,234,169,2,77,24,2
    08,141,24,208,32    :REM*4
180 DATA 222,192,169,64,76,108,
    192,32,222,192,120,169,0,14
    1,0,220,173,1       :REM*38
190 DATA 220,201,255,240,244,88
    ,76,132,192,169,0,133,212,7
    6,129,192,162,24    :REM*140
200 DATA 134,214,24,160,0,32,24
    0,255,76,129,192,166,214,13
    4,251,32,255,233    :REM*52
210 DATA 230,251,166,251,224,25
    ,208,245,160,0,24,166,214,3
    2,240,255,162,0     :REM*229
220 DATA 134,207,76,129,192,162
    ,8,134,198,169,29,157,119,2
    ,202,16,250,76      :REM*168
230 DATA 129,192,120,169,5,141,
    17,193,169,0,141,0,220,173,
    1,220,201,255       :REM*245
240 DATA 208,244,206,17,193,208
    ,239,88,96,65,35,44,135,7,1
    30,2,66,67,40,43    :REM*71
250 DATA 68,1,19,32,8,69,27,16,
    70,59,11,24,56,64 :REM*215
```


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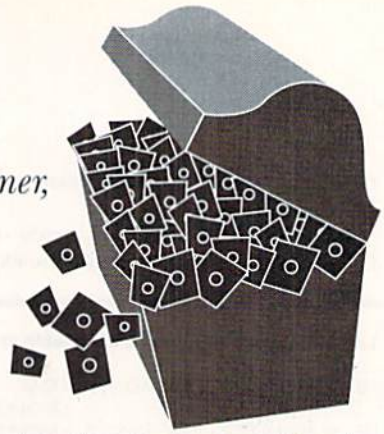
GOLD MINE



Here's the inside scoop on the hottest games, including Afterburner, Boulder Dash, Solomon's Key and Ikari Warriors 3.

By LOUIS F. SANDER

AFTERBURNER: On level 2, stay at the upper-left. On level 3, most of the targets will be in the middle of the screen, so shoot constantly in roughly a four-inch circle. You'll be safe at the lower-right corner of the screen. On levels 8 and 9, the safe area is at the lower left. When you reach level 10, you must constantly remain in motion. If you stand still you will die.

—EDDIE IVANOV
KANSAS CITY, MO

ALIEN SYNDROME: Here's all you need to know to beat this incredible game! RD1: Try to stay in a horizontal line with the alien when it swings around. This way you can hit it twice each time it attacks. RD2: The flame is a must. Get directly in front of the alien, and when the smaller enemies come too close, put the flame on them. As the bigger one rises, keep the flame on it as long as possible.

RD3: Go to the far left or right of the screen; the eyeballs won't bother you there. Keep attacking the eye socket. When it shoots, dodge at the last second. RD4: The enemy is vulnerable to bomb explosions, so use them to attack. RD5: The only towers you need to destroy are the two in your path and the one beneath you. Keep to the far left, and attack the jaw as it rises. Dodge at the very last second when it shoots.

RD6: Try to keep the blobs in a line between you and the alien. If they surround you, you're a goner! RD7: Timing is crucial. Go to one of the bottom corners. When the enemy sucks in his shots, rush to the head, shoot twice and rush back to the corner. You should make it just in time.

—RENE CUSSON
CHATHAM, NEW BRUNSWICK

BOULDER DASH: On level E, you normally have to release the firefly and get it stuck somewhere before getting the diamond. To avoid this, come up from underneath the diamond and wait until the firefly is directly on top of it. Then run off to the right side and the firefly will go in circles, leaving you alone.

—J. CHRISTOPHER BEAR
HOMER, IL

BUCK ROGERS: When you're engaged in ship-to-ship combat, destroy the enemy ship's control first, then close in and board the ship. After you have defeated the enemy's party, return to your own ship. The enemy will follow and attempt to board your vessel. Defeat the boarding party and their ship is yours, without having to explore it or fight the tough combat droids.

—JIMMY SNOW
WILLISTON, FL

COMMANDO: Here are the easiest ways to get through the first and last gates. At the first gate, move your man until the gate appears. Don't go near it until it opens by itself. Kill all the enemies, then move to the right or left side of the gate and approach it. Face the gate (don't stand too close) and shoot as the enemies come through. After all the enemies are dead, you'll easily get through the gate.

To go through the third and last gate, approach it and throw a grenade at the enemy on the left or right side of the gate. Then repeat the techniques you used to get through the first gate.

—XAVIER JOHN
BOROKO, PAPUA NEW GUINEA

DESTROYER ESCORT: When you're on escort duty and you encounter an enemy ship, use all your weapons to the fullest. Torpedoes are an excellent first choice, because they make the enemy do things he may not want to do. If your captain is rusty at using his weapons, play a few practice games on your own cargo ships. The worst that can happen is that you'll get thrown in the brig.

When you encounter airplanes, don't wait for them to come to you. Empty your AA clip of shells on them while they're still in formation. This way you can shoot down three or four of them before they even get near you.

—KEVIN SULLIVAN
SHAWNEE MISSION, KS

DIE HARD: To get past the fan, shoot a few rounds into the blade. You can then walk right through it. After the countdown when the roof is blown, run to the fire escape and jump. Going there too soon will result in fighting an unbeatable enemy. To stop your feet from bleeding, go to the bathroom and use the first aid box. Be quick, or you'll bleed to death.

—KEN ORDES, JR.
ARABI, LA

DOUBLE DRIBBLE: For 100 percent success with three-point shots, go to the far right and top of the screen. Don't step out of bounds. If you're playing at skill level 3, you must pass within a few seconds or the ball will be stolen from you.

—EDDIE IVANOV
KANSAS CITY, MO

HARDBALL: When you're the manager of the home team "Champs," playing against the computer as manager of the visiting "All Stars," have your batters swing at bad pitches. The other team's pitcher will throw many of them, giving you a lot of walks. Be careful to keep an eye out for that one home run pitch the pitcher will give away.

—KEVIN SULLIVAN
SHAWNEE MISSION, KS

HOSTAGE: If your man is caught in a spotlight, he will be shot. The access code for captain missions is ILIHP. Inside the embassy, you must kill all the terrorists. Hostages wear suits and ties, so be careful not to shoot them. Good luck!

—JOE VANDENBERG
RUTHVEN, ONTARIO

IKARI WARRIORS 3: Two-player cooperation is the way to get the best results in

this new adventure. Head for level 3, being careful not to lose your three lives along the way. At level 3, the first "unlimited continue" starts. Head next for level 5 with all your might; the second unlimited continue is there. If your other player is hit, help him or her out with a few punches to the enemy's back.

—John Hulsman
Jasper, IN

Infiltrator I: Whenever you show your papers, repeatedly hit your firebutton. If you do it fast enough, the guards will always accept your papers.

—Ian Rohrbacher
Barrington, NH

Jeopardy: To get higher scores when playing by yourself, make up two imaginary friends to play instead of the computer. This way you will be the only one competing to buzz first. As you know, the computer usually beats you to the punch, and is never wrong with the answer.

This technique works with lots of games, like Wheel of Fortune, Concentration and any other game where you play against human or computer opponents.

—Don Grangruth
Auburn, WA

Might and Magic II: Here's a way to gain those hard-to-earn experience points. First, put a spell-caster with the Frenzy spell in your party. To get Frenzy, go to area B4, coordinates X,44 Y,37, and defeat the Amazons. Next, get into a fight and cast Frenzy on any character. The spell will render him unconscious. Revive him while you're still in the fight. Now, when you exit, your character will have gained one hundred million experience points! This tactic works once for each character.

—Scott Hyatt
Charleston, SC

Project Firestarter: To kill the monster with the laserproof skin, get him to follow you to the radiation room. Raise the lead shield until he dies, then close it quickly. (It can kill you, too.)

To get to the spaceship at the end of the game, run through the monsters. Shooting at them will only waste time and probably will get you killed.

—Ken Ordes, Jr.
Arabi, LA

Red Storm Rising: My biggest hint for winning this game is to have patience! The safest way, and sometimes the only way, of finding enemies is by using your towed array and passive sonar. This means moving slowly, usually near the thermal layer. Also, use the sprint and drift technique—it works!

When fighting surface ships with missiles, always give room for the missile to home. If you set the PAP too close to the target, the missile will often miss. When using Sea-Lances, however, you should set the PAP close to the target or even on top of it. Again, be patient. Sea-Lances often hit their targets, but it takes a while for them to home in.

—Robert T. Timmons
North Bergen, NJ

Secret of the Silver Blades: The temple above the mines contains three secret doors; one is behind the altar. Through this door and then the door to the west leads to money. Leave the altar room via the south-east corner door. Turn south, go to the end of the hall and turn east: you'll find another secret door. Go through this door and turn south. Enter the next door, go to the north-east corner of that room and turn north. Here you'll find a pile of magic items.

You must destroy the barrier in the shaft to get to level nine or ten. To do it, step through the malfunctioning teleporter in the north-west section of level eight. As you exit, be prepared to fight Umber Hulks. Go down the tunnel and you'll find the barrier device. It is automatically destroyed when you find it.

—Dustin Winters
Sayville, NY

Solomon's Key: If you can get to the higher levels, fireballs become more desirable than lives. So, in the lower levels it's worth losing lives to get fireballs.

If you cast a spell on a Superfireball, it becomes a piece of the scroll that determines how many fireballs you can hold. Therefore, you can hold one more.

You get an extra man when you get ten fairies. Finally, there are two hidden gold pots that will give you an extra life. On levels 3 and 4 the pot is in the center of the top row. On 2 and 6 it's almost in the center of the screen. Just put a block where the pot should be, then remove it. The pot will magically appear.

—J. Christopher Bear

Starflight: When exploring planets with the terrain vehicle, it's a good idea to save your game before disembarking. Also, you should return to the ship when your energy level gets below 60. If you run out of fuel, just reload your saved game.

It is quicker and easier to take fluxes to your destination. You can find flux matches in the notices at Starport, in the clue book, or get them from alien races.

There are some alien races you should avoid. Specifically, the Spemin, Gazurtoids and Uhlek.

—Randy Clarke
Colorado Springs, CO ■

To submit your own game tips for consideration, send them to The Gold Mine, PO Box 101011, Pittsburgh, PA 15237. Put your name, address and Social Security Number on each submission; please use 8 1/2-by-11-inch paper and state which computer your tip is for. RUN *pays five bucks for each tip used.*

To order Lou Sander's Gold Mine, *a book of over 1200 Gold Mine tips, call TAB Books at 800-822-8158 (in Pennsylvania, call 717-794-2191) and ask for book #3323 ($19.95, paperback).*

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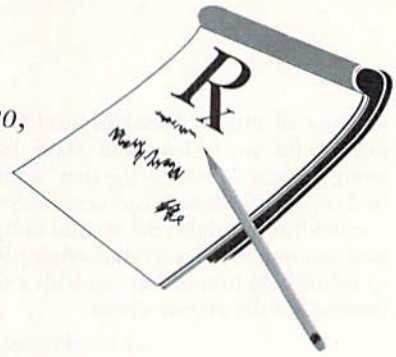
COMMODORE CLINIC

This time the doctor gives advice on resumé writing, C-64 video, learning to program, and C-64 and 128 compatibility.

By ELLEN RULE



Q *Is there a program that will let me create, edit, save and view resumés for a small business that I run?*

—DAVID STUART
ATLANTA, GA

A Mavis Beacon Teaches Typing (from The Software Toolworks) contains a fill-in-the-blank resumé-writing feature that helps you organize your information and decide what work experience to emphasize and which skills to include. The file may be saved for editing with your word processor.

You could also use a word processing program to create a template using your preferred resumé format, referring, if you wish, to one of the many books about resumé writing. Load the template, create the resumé, and save it under another filename if your word processor allows this. Or, make a file copy of your resumé template with the new filename and then fill in the information you desire.

Q *I have a Commodore 128, and supposedly all C-64 games can run on it in 64 emulation mode. I have a game by Epyx called "Rescue on Fractalus!" that is an exception. It shows the title screen, but when the game comes on it shows a lot of garbage instead of graphics. I can still hear music and play the game, but I can't see what I'm doing. Is there any way to correct this?*

—JULIAN MILLARES
TAMPA, FL

A Commodore tried to make the C-128 100 percent compatible with the C-64. In nearly every case they succeeded. You may have discovered one of the very rare exceptions.

To use 64-mode software on your 128, be sure your computer and disk drive are in 64 emulation mode by holding down the COMMODORE key when you turn the computer on, rather than using the command GO64. If this doesn't solve the problem, try unplugging any peripheral devices (cartridges, printer, etc.). You might try booting from a friend's 1541 drive attached to your 128 to rule out drive-compatibility problems.

Contact the software company to see if they have upgraded the title to be more compatible with the 128. If these all fail, you may have a hardware problem such as a bad memory chip, MMU or PAL, in which case a visit to the Commodore repair center is necessary.

Q *I have a C-128 with a 1571 drive, a Magnavox Color Monitor 40 and SR-2000 printer. When I try to run programs that say they use 80 columns, the screen goes blank. Is there anything I can do to correct this problem?*

—TOMMY LEE RAMAGE, JR.
BASTROP, LA

A You need to connect the separate 80-column RGB output of your 128 to your monitor. To do this, you can use an 80-column adaptor cable, available from many of *RUN*'s advertisers, which will let you see the 80-column output in monochrome (black and white) on your Magnavox Color Monitor 40. For a higher quality 80-column display, you'll need an RGB-I (digital) 80-column monitor, such as the Commodore 1084-S/D, and the correct cable to connect it to your C-128.

Q *I own a Commodore 64 and have been searching for a programming manual for beginners. What titles do you recommend?*

—JOSEPH BROUGHTON
LAS VEGAS, NV

A The titles I've found useful when teaching Basic programming include *Basic Commodore 64 BASIC* by James S. Coan (Hayden Book Co., Inc.), *The Elementary Commodore 64* by William B. Sanders (Datamost, Inc.), and *Learn BASIC in 14 Days on Your Commodore 64* by Gil M. Schecter (Howard W. Sams & Co., Inc.). For 128 programming, there's *Commodore 128 BASIC Training Guide* by Frank Kampow (Abacus).

Some of these titles are out of print, but you might find them at a library, user's group or Commodore dealer. (For more helpful books about Commodore computing, see "Required Reading" in *RUN*'s July/August 1991 issue.)

Q *Some of my disks that used to load now won't, and the error channel says #23 READ Error. I checked my drive and it's in alignment. My 1541 manual says this problem can be corrected, but it doesn't say how. What's the problem, and how can I fix it?*

—JIM SCHUSTER
FAIRPOINT, OH

A A #23 READ Error means a data block was read into the DOS buffer and a checksum error occurred. (One or more data bytes in the buffer were incorrect.) Your troubleshooting technique should examine the possibility of either a hardware or software problem.

The easiest solution could be simply moving your disk drive away from the monitor or power supply. RF interference (from the monitor or power supply) has been known to cause such problems.

To see if the disk is damaged, try loading your programs at your local Commodore dealer or on a friend's drive. If you find that a disk is defective, save as many files as possible onto another disk to prevent further loss. Some commercial copiers, such as Maverick, attempt to fix any errors it finds in copying. You could also recover the data by reading and rewriting the defective sector using direct access commands, a task for someone experienced in that area.

If your disks load properly on another system, try the disks and your drive on a different C-64 to see if the problem is with the drive or the computer. Since you have many disks with this READ error, you may have a hardware problem causing the drive to either write or read the data incorrectly. This can be due to various problems, including misaligned heads (the most common), a grounding problem or a malfunctioning CIA chip.

If you find that the problem is with the drive, there are several steps to take. I know that you've checked the alignment, but you didn't say how. Commercial programs that test alignment are not 100 percent accurate. If you haven't done so,

take the drive to a Commodore repair center for testing. Using an oscilloscope and an analog alignment disk is the only way to be certain that the heads are aligned correctly.

Gently cleaning the disk drive's read-write head with denatured alcohol and carefully lubricating the guide rails with Teflon grease may improve drive performance, or a worn-out pressure pad may need to be replaced. Remember that opening your drive could damage it and will void any existing warranty. If you are at all unsure about these procedures, save yourself some headaches by taking the unit to a competent repair person.

Finally, if you suspect grounding or chip errors, your repair technician can test and repair the problem.

Q *Is there a difference between the 1541 disk drive and the 1541-II? My 1541-II will load all of my programs perfectly, but my rebuilt 1541 disk drive will not load my more expensive programs like Gunship. When I try to load these programs, the drive tries to access a track beyond track 35. If there is any home remedy, please let me know.*

—Aaron Braun
City Unknown

A You may be suffering from an alignment problem, or your 1541 disk drive might contain an older version of the drive ROM chip. A technician can test your drive's alignment, and can upgrade the ROM chip to the latest version (05) if it's necessary.

Q *When I turn on my 64, the screen is black. The power light shows but there's no action. I tried the power supply on my uncle's 64 and the same thing happened. How can I fix my power supply?*

—John Hulsman
Jasper, IN

A The stock 64 power supply is not serviceable. I'm afraid you have to purchase a new power supply. I'd recommend one that has a replaceable fuse and allows access to the other internal components for repairs, should they become necessary.

A word of caution about your troubleshooting techniques: A bad power supply can sometimes damage your computer by sending it too much power. To prevent damage to another 64, try the known good power supply on the "dead" computer. You can protect your computer from a bad power supply by installing a product called the Computer Saver, an in-line, plug-in device that shuts off power to your computer if it detects even a momentary surge. This device is being distributed exclusively through The Grapevine Group, 3 Chestnut St., Suffern, NY 10901, 800-292-7445.

Q *I use my Commodore 64 for editing video films. How can I record from the 64 to my RCA camcorder?*

—Marcel Boisvert
Thunder Bay, Ontario

A You can connect your 64 or 128's composite (40-column) video output directly to a VCR or camcorder by plugging your monitor cable into the recorder's video-in jack. (You may need an RCA-type Y-cable to combine the chroma and luma signals from your computer.) To monitor what you're recording, run a cable from the video-out jack of the recorder to your monitor. [*See page 48 in this issue for more on hooking your computer up to a VCR.—Editors*]

Q *My brother and I are interested in telecommunicating with our 64s. Do we have to subscribe to an on-line network and pay connect-time charges to do it? We live two miles apart in the same city. Isn't there some way we can connect our 64s just by calling each other? Is there a P.D. terminal program that will allow us to do this?*

—Mark Murphy
San Leandro, CA

A You're right, you don't need to go through an on-line network to communicate directly with each other, and since you and your brother live in the same city, you don't have to worry about running up big phone bills. You can use your modems to connect your computers to the phone lines using almost any telecommunications program, such as RUN Term 64/128 found on our RUN Works and Super Starter Pak disks.

Most Commodore-compatible modems, such as the 1660 and 1670 modems sold by *RUN*, come with a terminal program that lets you type messages and transfer files over the telephone lines. Just be sure that one modem is in Answer mode and the other in Originate. The instructions that came with your modem should explain how you can do this.

You may be able to find some games for the 64 that were designed specifically to be played over the modem, such as Modem Wars (Electronic Arts) and The American Challenge: A Sailing Simulation (Mindscape). For more information on telecommunications, see Tim Walsh's article, Commodore Connection (*RUN*, March/April '91).

Q *We have a C-64 with a 1541 drive, a Zenith monitor and an Okidata 180 printer. We would like to learn more about our computer and update it. We are interested mainly in a color monitor with sound, and possibly a newer disk drive. Do you know where we can buy used computer equipment?*

—Marilyn Eickelberg
Tomahawk, WI

A With the addition of a color composite monitor, you will have a good basic system. Before you make any major purchases, however, learn as much as you can about your computer and what it can do. Decide what you want to do with it and what kind of equipment you'll need before making your investment.

Computer Shopper (available at newsstands) and the yellow pages are both good sources for used computer hardware. Other good sources of information and used hardware are your local Commodore dealers and user's groups. (See *RUN's* May/June '91 issue and Mail RUN to locate a user's group near you.)

Q *I would like help on using BASIC 8. Where can I find information?*

—Bill Simmons
Whitman, MA

A Check out *Getting the Most Out of BASIC 8* by Dave Krone and Roger Silva, published by Free Spirit (PO Box 128, Kutztown, PA 19530). This book is available from many Commodore dealers, as well as mail order companies that advertise in this magazine.■

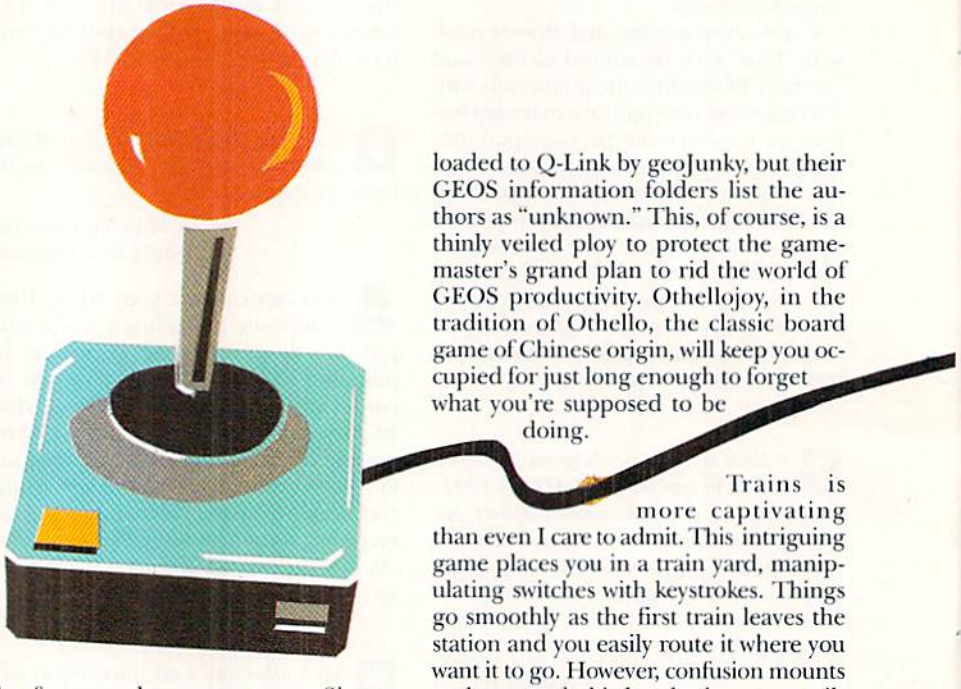
Editor's Note: In the July/August 1991 Commodore Clinic column, we said that the Memory Saver II was available through D5 Associates. We goofed! That product is being distributed through The Grapevine Group at 800-292-7445.

Do you have a question about your Commodore computer system, software or programming? Send them to Ellen Rule, c/o Commodore Clinic, RUN *Magazine, 80 Elm St., Peterborough, NH 03458. Questions are answered only through this column, and, due to the volume of mail received, only questions likely to benefit a number of readers can be published.*

GEOWATCH

Just when you thought you would get some work done . . .
Invasion of the productivity snatchers!

By GERRY DESCOTEAUX



YOU DON'T *HAVE* TO BE productive. Not all the time. *Really.* It's not even good for you! To prove the point, some devilish programmers have infiltrated *even* the GEOS realm, determined—in spite of the fact that GEOS is packed with productivity—to keep the Commodore the great game machine it was meant to be.

Well, we GEOS folks have asked for it. With our easy-to-use word processing, file management, spreadsheet and desktop publishing applications, we've simply gone too far and actually convinced a large segment of GEOS users that the C-64/128 is useful for something *other* than entertainment.

The "gaming gods" won't stand for it, so they've started a campaign to tempt GEOS users from their work. I'll admit up front, I've succumbed. So, to assuage my guilt, I intend to make *you* succumb, too! The next time the "shoulds and oughts" threaten to control your life, you can cure your compulsive productivity with these addictive games.

Sure Cure for Productivity

GeoNim, written by truly possessed gamester Ed Pflager, will keep you out of work mode for at least a few minutes of extra coffee-break time. Pick a number from one to three and chip away at it in this nonstandard (11-chip) game. Whoever (you or the computer) takes the last chip loses. It's fiendishly fantastic.

I also have to mention Ed's **GEOSTac-Toe**, which, by the way, I can beat. Can you?

Cluster Wars is sure to seduce any adventure role-playing enthusiast. Described by its author, Francis G. Kostella, as "another bloody control-the-universe strategy game," it's much like the "fight-battles-and-collect-stuff" multiplayer games found on BBSs, but with graphics and mouse control. It can be saved to disk and played over a span of months or even years. At 35K, Cluster Wars is the largest program in this group and includes both instructions and a brief scenario to get you in the right frame of mind to play. This one is a beauty—you may *never* get back to work.

GeoMimic by Sean Huxter takes after the fast-paced memory game Simon, which was popular in the early 80s. In color and run as a desk accessory, Mimic will keep you from more pressing tasks for quite some time.

Another real-world emulation, Robert B. Cook's **PhaserPhire**, lets you blow off steam by shooting at ships. Complete with graphics and sound, this Battleship-type game has all the ingredients needed to get you out of Productivity mode and into Stress-relief mode.

GeoWord, based on Boggle from Milton Bradley, comes with instructions and a serious word-list file (more than 1600 words) that makes beating the computer quite an accomplishment. Written by David B. Ferguson, this game will distract everyone in the room into trying to find as many words as possible in three minutes (a devious plot to get the whole office fired).

Shell Game, written by Wesley M. Allison and based on the traditional guessing game, also provides plenty of diversion. So does Wayne Dempsey's **geoBreak**, fashioned after the popular Breakout game of days past. Available on *RUN*'s first GEOS Power Pak disk, this diabolical multilevel arcade-style game will entice you from even the easiest task.

My two favorite procrastination producers, **Othellojoy** and **Trains**, were uploaded to Q-Link by geoJunky, but their GEOS information folders list the authors as "unknown." This, of course, is a thinly veiled ploy to protect the gamemaster's grand plan to rid the world of GEOS productivity. Othellojoy, in the tradition of Othello, the classic board game of Chinese origin, will keep you occupied for just long enough to forget what you're supposed to be doing.

Trains is more captivating than even I care to admit. This intriguing game places you in a train yard, manipulating switches with keystrokes. Things go smoothly as the first train leaves the station and you easily route it where you want it to go. However, confusion mounts as the second, third and subsequent rail-riders leave the depot. They're all going different ways, and you must scramble to avert collisions between trains and at dead-ends. With three levels of fun, this game gets my vote as the all-time work stopper!

Ok . . . Back to Work Now

Most of these games can be downloaded from Q-Link (see *RUN*, May/June 1991 for downloading tips). All can be accessed from inside the GEOS environment and will return you there when you're done playing. If you use a RAM expansion unit as a RAMdisk, place your favorite games on it along with other frequently used files and RBoot.

Some of these programs run in Basic and will return you to the Basic screen. Just type LOAD"RBOOT",8,1 to return to GEOS with everything in RAM just the way you left it.

So there they are. The disciples of debauchery have devised enough boredom-bashing programs to keep you occupied for a long while. *Now* let's see you get your work done! ■

Gerry Descoteaux somehow manages to write frequent articles for RUN *between games of Othellojoy and Trains. He is also a musician and publishes a regional music magazine using his C-64 and GEOS.*

ILLUSTRATED BY HOWARD HAPP

MULTICOPY

Continued from page 29.

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    CØD414E442ØD3       :REM*182
241 DATA DØC1C3C52Ø544F2Ø5345*4
    C4543542C2ØD2C5D4D5*D2CE2Ø5
    44F2Ø45584543       :REM*23
242 DATA 5554452E8629E425DØØ3*A
    6272CA628862A853684*3718690
    6852E9Ø01C884       :REM*164
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244 DATA A9922ØD2FFA416A617CA*1
    82ØFØFFA2EBAØ3886ØA*84ØBA92
    82Ø763222Ø362E      :REM*37
245 DATA A2ØØ863A863E861Ø8646*2
    4461ØØ9A51Ø38E519FØ*5CBØFAA
    5321869Ø28532       :REM*218
246 DATA 9Ø02E633AØØØA5349132*C
    8A5359132AØ25A9AØ91*3488DØF
    BA92591342446       :REM*98
247 DATA 3Ø1D2Ø763ØBØ162Ø1B31*2
    ØB33ØBØØE2ØE23ØBØØ9*E63AA52
    AFØØ52Ø1F3Ø66       :REM*248
248 DATA 462ØFE2EA5421869Ø385*4
    29Ø02E643E61ØA51Ø9*FF9Ø992
    ØCCFFA9E12Ø9C3      :REM*48
249 DATA FFA534854E853FA53585*4
    F8549A53ADØØ16ØAØØ4*9136A63
    6A4372ØE6322Ø       :REM*199
25Ø DATA 5C2E2Ø4F2F2ØFD32A9Ø1*8
    51Ø2Ø52332ØBB1F1Ø14*2Ø2D28A
    9132ØD2FF2ØD2       :REM*132
251 DATA FF2ØØ7282Ø4C242Ø2528*2
    ØE4FFC9ØØFØE9482Ø55*3368C9Ø
    3DØØ5A9ØØ853A      :REM*186
252 DATA 6ØC911FØ32C991FØ4DC9*2
    ØFØØFC95FFØ4DC9ØDDØ*BB24417
    ØØ3A53A6Ø2Ø9F       :REM*14Ø
253 DATA 322Ø4C2E24413ØØB7Ø03*4
    C812D2ØFD32A53A6Ø2Ø*882E4CØ
    12EE639A539C5       :REM*69
254 DATA 3A9Ø04A53A85392ØØA2F*2
    4563ØØ34C812D2ØFD32*2Ø7D2E4
    C812DC639DØE9       :REM*57
255 DATA E639DØF524413ØF17ØEF*A
    53185ØBA53Ø85ØAA53A*8511Ø04
    C2EA5ØA186926       :REM*8Ø
256 DATA 85ØA9Ø02E6ØBC611DØEE*4
    CFE2DA93C8543A9E785*42A9Ø08
    544A2Ø3B52E95       :REM*73
257 DATA 32CA1ØF96ØAØ1B1ØAC9*B
    ADØ3A92Ø2CA9BA91ØA*6ØAØØA
    216182ØFØFF24       :REM*243
258 DATA 417ØØE3Ø06A299AØ2BDØ*Ø
    AA24ØAØ2CDØØ4A2ØØAØ*2C4C993
    2A53938E53818       :REM*198
259 DATA 69Ø1851Ø6ØC9BAFØ2DA5*4
    F85ØBA54E85ØAA5ØAC5*3FA5ØBE
    5409Ø016ØAØ1        :REM*158
26Ø DATA B1ØAC539DØØ4A9ØØ91ØA*A
    5ØA18692685ØA9Ø02E6*ØB4C942
    EA9122ØA92AØ8       :REM*55
261 DATA 2Ø7D2E2Ø9F3228DØØ34C*4
    C2EAØØ1A539913FAØØ3*B1ØA913
    FC8C9AØDØF7AØ       :REM*149
262 DATA 14A2ØØBDØ1Ø2913FC8E8*E
    CØØØ29ØF4A9AØ913FE6*3EA53F1
    86926853F9Ø02       :REM*134
263 DATA E64Ø6ØA5341869268534*9
    Ø02E6356ØA9ØØ8556A5*3938E53
    89Ø18AAE8861Ø       :REM*145
264 DATA E4199Ø2ØFØ1EC656A519*4
    A186538BØ2685389ØE1*C656A51
    94A49FF386538       :REM*91
265 DATA 9Ø168538BØD1A53838E9*Ø
    1ØA18652E851CA9ØØ65*2F851D6
    ØA52F851DA52E       :REM*198
266 DATA 851CA9Ø1853985386Ø24*2
    3ØC5531Ø352Ø3Ø2Ø31*382Ø3Ø3
    ØØ8422D5Ø2Ø35       :REM*164
267 DATA 2Ø3Ø3Ø5345512Ø5Ø5247*2
    Ø555352252454C2Ø43*424D2ØA
    52AFØ123ØØ6A9       :REM*51
268 DATA 34A23ØDØØ4A931A2388D*6
    82F8E692FA52AFØØDA9*E1AØØ52
    ØFE1EA25FAØ2F       :REM*173
269 DATA DØØBA9E1AØØØ2ØFE1EA2*5
    EAØ2FA9Ø12ØBDFF2Ø26*1F4C7Ø1
    F2ØCB2FAA2Ø2Ø       :REM*135
27Ø DATA 1F48A59ØC94Ø686ØA9ØØ*2
    CA92285ØC2ØCB2FBØØ5*C5ØCDØF
    7186ØA52AFØØA       :REM*45
271 DATA A93ØAA2Ø423ØA9ØDØØB*A
    2E12Ø1A1F2ØC72F2ØD8*2FA2ØØA
    52AFØØ6B9EB3A       :REM*134
272 DATA 4C113Ø2ØCB2FBØØD9DF2*3
    8C8E8EØ1Ø9ØE8A52ADØ*116Ø2Ø2
    53ØBØØB6ØADEA       :REM*16Ø
273 DATA 3A18692Ø8DEA3A6ØADEB*3
    ADØØ2386ØAEEC3A2Ø1F*34AD973
    9AE98398D6B2F       :REM*2Ø8
274 DATA 8E6C2FA9318D622FA629*2
    ØØE1FA26ØAØ2F2Ø9932*2ØCCFFA
    2E12Ø1A1FAØØØ       :REM*9Ø
275 DATA 2Ø2Ø1F99EB3AC8DØF72Ø*C
    CFFA9Ø28DEA3A186ØA5*2AFØ1CA
    CEA3AB9EB3A3Ø       :REM*239
276 DATA Ø62Ø1F3Ø9ØF36ØB9ØØ3B*4
    8B9Ø73BAAB9Ø83B189Ø*ØF2ØD52
    F9ØØ16ØA9ØØ48      :REM*3Ø
277 DATA 2ØC72F2ØC72FAØØ19142*C
    8689142AØØØ8A914260*A52AFØ1
    6AEEA3AAØØ3BD       :REM*8Ø
278 DATA EE3AC9AØFØØ89134E8C8*C
    Ø139ØF1186Ø2ØD82FAØ*Ø32ØCB2
    FBØØAC922FØØ5       :REM*132
279 DATA 9134C8DØF2186ØA52AFØ*1
    AACEA3AB9EB3A297FØA*ØAAAAØ2
    3BD722F9134C8       :REM*134
28Ø DATA E8CØ269ØF5186Ø2ØCB2F*B
    Ø15C92ØFØF7AØ23DØØ5*2ØCB2FB
    ØØ89134C8CØ26       :REM*2Ø9
281 DATA 9ØF4186ØA52ADØØ16ØAC*E
    A3AA2ØØ8611B9Ø13B95*47Ø5118
    511C8E8EØØ49Ø       :REM*157
282 DATA F1A511FØE5AØ14844BA9*2
    FA2Ø42Ø6Ø312Ø5E31A9*ØØA2Ø72
    Ø6Ø31AØ1D844B       :REM*27
283 DATA A93A2Ø5E31A9ØØA2Ø6DØ*Ø
    2A2Ø548A9ØØØ64A2649*2648264
    72ACADØF4AA2Ø       :REM*143
284 DATA 1F34A2ØØA44BBD973991*3
    4C8E8EØØ29ØF568FØØ3*9134C88
    44B6ØA9328D62       :REM*19Ø
285 DATA 2FA6292ØØE1FA26DAØ2F*2
    Ø99322ØCCFFA2E12ØØE*1FAØØØB
    9EB3A2Ø141FC8       :REM*84
286 DATA DØF72ØCCFFA6292ØØE1F*A
    26ØAØ2F2Ø99324CCCFF*2ØAD32A
    416A617182ØFØ       :REM*3Ø
287 DATA FFA51B2ØD2FFA9BØ2ØEB*3
    12Ø1232A519851Ø2Ø12*32C61ØD
    ØF9A9AD482Ø76       :REM*141
288 DATA 3368482Ø4B322Ø533268*4
    82ØD2FFA9CØA6182Ø41*3268C9B
    ØFØØ7C9ABFØØ6       :REM*1Ø4
289 DATA A9BD2CA9AE2CA9B34CD2*F
    F2Ø76332Ø4B322Ø5332*A9DD2ØD
    2FFA92ØA6182Ø       :REM*99
29Ø DATA 4132A9DD4CD2FFA9122Ø*D
    2FF8A48382ØFØFF68AA*A92Ø2Ø4
    1324C5532CA1Ø       :REM*18Ø
291 DATA Ø16Ø2ØD2FF4C413248A9*1
    22ØD2FF6860A41624Ø9*3Ø03A6D
    62CA6EB184CFØ       :REM*145
292 DATA FF2ØD2FF8A482Ø2C32AØ*Ø
    Ø2ØA332682Ø76324C76*33AØØØ3
    8F1ØA4AAAA92Ø       :REM*93
293 DATA 2Ø4132AØØØB1ØA85ØCFØ*Ø
    AC8B1ØA2ØD2FFC4Ø6Ø9Ø*F66ØA2C
    2AØ3486ØA84ØB      :REM*55
294 DATA DØE3A51ØØAA8B11C85ØA*C
    8B11C85ØB6Ø861C841D*AØØ5B11
    C9916ØØ881ØF8       :REM*26
295 DATA A9Ø618651C851C9ØØ2E6*1
    D6Ø2Ø9532201733A2F4*AØ342ØE
    632A264AØ352Ø       :REM*18Ø
296 DATA E632A2D8AØ382ØE632A2*A
    8AØ352ØC131A416C8A6*17E8182
    ØFØFFA618A99E       :REM*2Ø2
297 DATA 2Ø62322Ø7633A9Ø1851Ø*A
    51ØC5199ØØ3FØØ16ØC5*1AFØØ2B
    ØF92Ø5533E61Ø       :REM*124
298 DATA DØEAA2CEAØ34861C841D*2
    Ø79332ØBB1F3Ø03A927*2CA94FA
    A48A91E2ØD2FF       :REM*192
299 DATA A9922ØD2FFA9AF2Ø4132*2
    Ø76336848AAA91E2Ø62*3268AAA
    9B72Ø41324C76       :REM*119
3ØØ DATA 33A9922CA91248A51Ø38*6
    517AAA416C8182ØFØFF*A51B2ØD
    2FFA61868 2Ø2E      :REM*147
3Ø1 DATA 322Ø9F322Ø8232A9ØD2C*A
    9132CA9934CD2FFA9ØØ*A2Ø285Ø
    E86ØFAØØØB1ØE       :REM*74
3Ø2 DATA 8514A9ØØ8511C8B1ØEC9*3
    Ø9Ø1BC93ABØ1729ØF48*A511ØAØ
    A186511ØA8511       :REM*145
3Ø3 DATA 681865118511C4149ØDE*A
    5116Ø86118512A2Ø2A9*ØØ8D9D3
    99D8239CA1ØFA       :REM*41
3Ø4 DATA 78F8AØ1ØØ6112612A2Ø2*B
    D82397D82399D8239CA*1ØF488D
    ØEBD858A2Ø2AØ       :REM*188
3Ø5 DATA Ø6BD82394829ØFØ93Ø88*9
    99739684A4A4A4AØ93Ø*8899973
    9CA1ØE6A99785       :REM*155
3Ø6 DATA ØEA93985ØFA2ØØBD9739*C
    93ØDØØBE6ØEDØØ2E6ØF*E8EØØ5D
    ØEE6ØA9ØØ2Ø34      :REM*141
3Ø7 DATA 34CØØ1DØØBAD97398D98*3
    9A93Ø8D97396Ø2ØB833*AØØØB1Ø
    EFØØ6999739C8       :REM*185
3Ø8 DATA DØF68C96396ØA21F8EØØ*D
    62CØØD61ØFB8DØ1D66Ø*A21F8EØ
    ØD62CØØD61ØFB       :REM*11Ø
3Ø9 DATA ADØ1D66ØA2132Ø493498*C
    A4C493448A9Ø22CA9ØØ*A2ØØ864
    786488649A21Ø       :REM*2Ø2
31Ø DATA 864AA22Ø864B48AAB547*B
    448A2212Ø6534684849*Ø2AAB54
    7B4482Ø6334A2       :REM*158
311 DATA 182Ø5734Ø98Ø2Ø4934A2*1
    EA98Ø2Ø4934A98Ø1865*4785478
    5499ØØ4E648E6       :REM*45
312 DATA 4A68C64BDØC4Ø6554AØB*Ø
    9ØCØEØ8ØB13131B4E93*92DØ342
    3D2D5CE2ØC3CF       :REM*121
313 DATA DØD92ØC9C92Ø2843292Ø*3
    13939312ØD22E2ØD24F*434B454
    6454C4C4552Ø0       :REM*75
314 DATA Ø314Ø3Ø39AØ235143529*3
    53E3511C15641494C41*424C452
    ØC44556494345       :REM*184
315 DATA 5314Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø*2
    Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø*2Ø2Ø142
    Ø2Ø2Ø2Ø2Ø2Ø2Ø       :REM*185
316 DATA 2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø*2
    Ø2Ø2Ø142Ø2Ø2Ø2Ø2Ø*2Ø2Ø2Ø2
    Ø2Ø2Ø2Ø2Ø2Ø       :REM*1Ø1
317 DATA 2Ø2Ø2Ø2434F4D5Ø4154*4
    9424C452Ø2Ø2Ø2Ø2Ø*2Ø03ØAØ
    EØ3Ø39A72357B       :REM*158
```

```
318 DATA 358A359935Ø8D3455454*4
    94E4753ØE46524F4D2Ø*4445564
    943452Ø2Ø2ØØE          :REM*4Ø
319 DATA 544F2Ø44455649434520*2
    Ø2Ø2Ø2ØØE50524F4D5Ø*542Ø3D2
    Ø2Ø2Ø4F464617          :REM*171
32Ø DATA Ø3ØEØCØC9BC835D1352E*3
    6DC35E935F735Ø436Ø A*3616362
    1363C3647366Ø          :REM*121
321 DATA 36Ø8C34F4D4D414E4453*Ø
    A434F5Ø592Ø46494C45*53ØC564
    552494659 2Ø46          :REM*199
322 DATA 494C4553ØD5343524154*4
    3482Ø46494C4553ØC52*454E414
    D452Ø46494C45           :REM*6
323 DATA 53Ø555534147 45Ø B464F*5
    24D41542Ø4449534BØA*4552415
    3452Ø4449534B          :REM*11Ø
324 DATA ØC5Ø4F4C4C2Ø44455649*4
    34553ØD5Ø524F4D5Ø54*2Ø4F4E2
    F4F4646Ø A434F         :REM*117
325 DATA 4D5Ø415449424C45ØBC4*C
    FD32Ø434F4D4D414E44*ØC53554
    2444952454354          :REM*134
326 DATA 4F5259Ø45155495 4ØØØB*2
    5Ø1Ø19E6F368B36ØØD7*5249544
    94E472Ø222Ø2Ø          :REM*222
327 DATA 2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø*2
    Ø2Ø2Ø2Ø2Ø2ØØØØØB25*Ø1Ø19E9
    636ØØØ2ØCC652          :REM*235
328 DATA 4F4D2Ø4445564943453F*Ø
    AD44F2Ø444556494345*3F1ØC54
    E544552Ø4449           :REM*81
329 DATA 534B2Ø4E414D453AØEC5*4
    E5445522Ø4449534B2Ø*C9C43AØ
    EC44556494345          :REM*185
33Ø DATA 2Ø4E554D4245523F14D2*4
    54E414D452Ø46494C45*2Ø544F2
    Ø574841543F23          :REM*44
331 DATA C94E534552542ØC6D2CF*C
    D2Ø4449534B2C2Ø5448*454E2Ø5
    4595Ø452ØD2C5          :REM*116
332 DATA D4D5D2CE2E21C94E5345*5
    2542ØD4CF2Ø4449534B*2C2Ø544
    8454E2Ø54595Ø          :REM*135
333 DATA 452ØD2C5D4D5D2CE2E13*C
    6494C45532Ø444F4E27*542Ø564
    552494659219Ø9         :REM*2Ø9
334 DATA C6494C45532ØCFCB2E16*C
    54E5445522Ø54494D45*2Ø28484
    83A4D4D3A5353          :REM*88
335 DATA 293A16C54E5445522Ø44*4
    154452Ø284D4D2F4444*2F59592
    93AØØCE4F2Ø52          :REM*68
336 DATA 45434F52442Ø53495A45*3
    A2Ø222Ø2Ø2Ø2Ø2Ø2Ø2Ø*2Ø2Ø2Ø2
    Ø2Ø2Ø2Ø2Ø2Ø2Ø           :REM*95
337 DATA 1AD3435241544348 2Ø22*2
    Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø*2Ø2Ø2Ø2
    Ø2Ø2Ø2Ø2Ø1EDØ          :REM*169
338 DATA 524F4D5Ø542Ø4245464F*5
    2452Ø52455Ø4C414349*4E472Ø4
    6494C45533F22          :REM*147
339 DATA C44546494E452Ø574849*4
    3482Ø4445564943452Ø*4153Ø24
    34F4D5Ø415449          :REM*49
34Ø DATA 424C453F1CC34F4D5Ø41*5
    449424C452Ø57495448*2Ø57484
    943482Ø445249          :REM*8
341 DATA 56453FØCC4CFD32Ø434F*4
    D4D414E443FØFD35441*5254494
    E472Ø54524143          :REM*18Ø
342 DATA 4B3FØDC54E44494E472Ø*5
    45241434B3FØFD35542*4449524
    543544F52592Ø          :REM*134
343 DATA 4E414D453F9636Ø2A336*Ø
    2AE3610BF36Ø2CE36Ø2*2839ØØD
    D3610F2360Ø16          :REM*171
344 DATA 37ØØ3837ØØ4C37ØØ5637*Ø
    86D3708843ØØA73Ø1*C337Ø1E
    2370205380422          :REM*1Ø4
345 DATA 38212F38Ø23F38Ø24D38*1
    ØØØØ425Ø6FF99AA3825*2Ø2Ø4E4
    14D4520202Ø2Ø          :REM*211
346 DATA 2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø44*4
    1544520202Ø2Ø2Ø5449*4D4522Ø2
    Ø5459500ØØE25          :REM*78
347 DATA Ø5FF9CAA38Ø611Ø8Ø1Ø1*9
    ED1ØAE238Ø83Ø3Ø3A3Ø*3Ø3A3Ø3
    Ø16CE414D453A          :REM*45
348 DATA 2Ø                :REM*2Ø9
349 DATA -1                :REM*2Ø7
```

■

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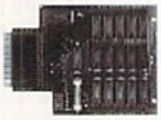

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RUN's Checksum & Program Typing Hints

TYPE IN *RUN*'S CHECKSUM, which serves for both the C-64 and for the C-128 in either 40- or 80-Column mode, and save it to disk before running it. When typing in a program from *RUN*, first load and run *RUN*'s latest version of the Checksum program, which contains a new feature explained below. The screen will display a SYS number (49152 for the C-64; 3328 for the C-128) that deactivates and reactivates the Checksum. Always disable *RUN*'s Checksum before attempting to run another program. Note: You can abbreviate Basic keywords; spaces affect the checksum only when within quotes; and the order of characters affects the checksum.

When you press return after typing in a program line, a one-, two-, or three-digit number from 0 to 255 appears in the home position. If this number matches the checksum value in the program listing, the line as you typed it is correct. If the number that appears doesn't match the checksum value, compare the line with the magazine listing to find your error. Then move the cursor back up to the line and make your corrections. Now, after you press return, the correct checksum value should appear. Continue entering the listing until all the lines have been correctly typed. Then deactivate *RUN*'s Checksum, using the appropriate SYS number, and save the finished program.

We sometimes get letters and phone calls from new readers who have typed in the Checksum program for the first time. They are confused by the "Out of Data Error in Line 30" message that appears when they try to run the Checksum program. Understandably, they compare line 30 of the listing with line 30 as they typed it in, and cannot find anything wrong. The message unintentionally misleads them into thinking the error is in line 30, whereas the typing mistake is actually somewhere in one of the Data statements in lines 190–350.

So, we've added a new feature to the Checksum program that alerts readers to the number of the Data statement line in the Checksum program where an error has actually been made. **Note that this feature works *only* on the Checksum program itself, and not on any other program listing in *RUN*.**

After you've entered and saved the Checksum program to disk, run it. If you've made any errors in any of the Data statements, the program will give you a specific line number. Find the mistake, correct it, press return, save the program and run it again. Repeat this procedure until the Checksum program runs flawlessly.

Control Characters Demystified

All the graphics and control characters in the listings in *RUN* have been translated into understandable key combinations. They are the instructions you see inside the curly braces. For example, {SHIFT L} means you hold down the shift key while you press the L key once. You do *not* type in the curly braces. What appears on the screen will look quite different from what is designated inside the braces. Here are some more examples:

{22 SPACES}—press the space bar 22 times.

{SHIFT CLR}—hold down the shift key and press the clr-home key once.

{2 CRSR DNs}—press the cursor-down key twice.

{CTRL 1}—hold down the control key and press the 1 key.

{COMD T}—hold down the Commodore logo key and press the T key.

{5 LB.s}—press the British pound key (£, *not* #) five times.

Refer to the following paragraphs for any other Error messages you get from running any program listing in *RUN*.

Other Error Messages

Having heard from many users over the years about their difficulties with typing in listings, we've identified a few recurring problems that plague many people but are easy to fix. So read on and see if your problem is one of these.

- You get an "Out of Data in Line xxx" message. This means that a program line was reading from Data statements and reached the end of the data before it was done reading. There are two possible problems.

One might be with the program line that reads the data, usually a For-Next loop. Make sure you have the proper values for the loop, because if, for example, the listing has a loop of 0 to 150, and you've typed 0 to 160, you'll get the Out of Data message. If the loop is correct, then the problem lies in the Data statements themselves. One possibility is that you omitted a whole line of data. That's easy enough to find and correct. It's more likely that you've skipped one or more individual data items or typed in a period instead of a comma, which causes two data values to be read as one number. Check your typing carefully against the listing. Using *RUN*'s Checksum program when you type in listings from the magazine should help in this case.

- You get an "Illegal Quantity Error in Line xxx" message. This means you've read a number from a Data statement and tried to poke it into a memory address. The error occurs because the number is larger than 255 (the largest value a memory address can contain), which means that somewhere in your Data statements you've made an error by typing in a number larger than 255. Again, this is easy to check for and correct. First look in your Data statements for a number larger than 255. You might have added an extra digit, or perhaps you ran two numbers together (23456 instead of 234,56).
- You get a "Syntax Error in Line xxx" message. This could be almost anything. What it tells you is that there is something wrong in the indicated line. Usually you've misspelled a Basic keyword or omitted some required character. List the line and examine it carefully.
- You get an "Error in Data" message. This occurs in programs that add up all the data as read, and, when finished, compares that sum with what it should be if the data were typed in correctly. If it isn't the same, it means an error somewhere in typing the Data statements. Go back and check the data carefully. Correct the mistake(s), save the new version and try again.
- Finally, we urge everyone who intends to type in one of our listings to use *RUN*'s Checksum program, which will help you avoid every mistake we've mentioned above, except that it won't detect the omission of a line. R

Listing. *RUN*'s Checksum program. This program is available on *RUN*'s BBS for users to download.

```
10 REM RUN'S CHECKSUM 64/128 - BOB KODADEK
20 MO=128:SA=3328:IF PEEK(4096)THEN MO=64:SA=49152
30 I=0:CK=0:CH=0:LN=190
40 FOR K=0 TO 16
50 FOR J=1 TO 10:READ B:IF B>255 THEN GOTO 170
60 CH=CH+B:POKE SA+I,B:I=I+1:NEXT
70 READ LC
80 IF LC<>CH THEN GOTO 170
90 CH=0:LN=LN+10
100 NEXT K
110 POKESA+110,240:POKESA+111,38:POKESA+140,234
120 PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":PRINT
130 PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO=128 THEN 1
    60
140 POKESA+13,124:POKESA+15,165:POKESA+25,124:POKESA+2
    6,165
150 POKESA+39,20:POKESA+41,21:POKESA+123,205:POKESA+12
    4,189
160 POKESA+4,INT(SA/256):SYS SA:NEW
170 PRINT"YOU HAVE A DATA ERROR IN LINE ";LN;"!":END
180 REM DO NOT CHANGE THESE DATA STATEMENTS!
190 DATA 120,162,24,160,13,173,4,3,201,24,884
200 DATA 208,4,162,13,160,67,142,4,3,140,903
210 DATA 5,3,88,96,32,13,67,152,72,169,697
220 DATA 0,141,0,255,133,176,133,180,166,22,1206
230 DATA 164,23,134,167,132,168,170,189,0,2,1149
240 DATA 240,58,201,48,144,7,201,58,176,3,1136
250 DATA 232,208,240,189,0,2,240,42,201,32,1386
260 DATA 208,4,164,180,240,31,201,34,208,6,1276
270 DATA 165,180,73,1,133,180,230,176,164,176,1478
280 DATA 165,167,24,125,0,2,133,167,165,168,1116
290 DATA 105,0,133,168,136,208,239,232,208,209,1638
300 DATA 169,42,32,210,255,165,167,69,168,170,1447
310 DATA 169,0,32,50,142,169,32,32,210,255,1091
320 DATA 32,210,255,169,13,32,210,255,104,168,1448
330 DATA 96,104,170,24,32,240,255,104,168,96,1289
340 DATA 56,32,240,255,138,72,152,72,24,162,1203
350 DATA 0,160,0,32,240,255,169,42,208,198,1304
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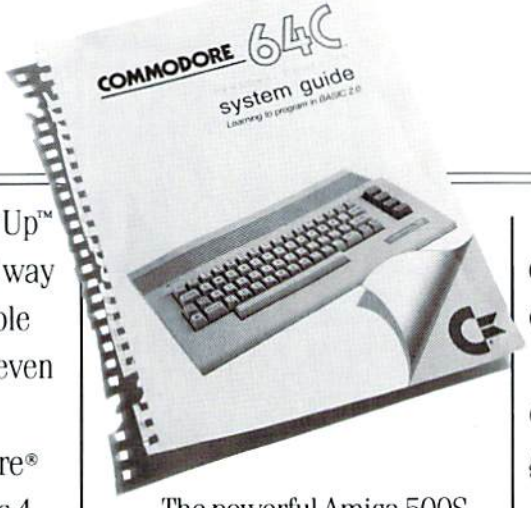

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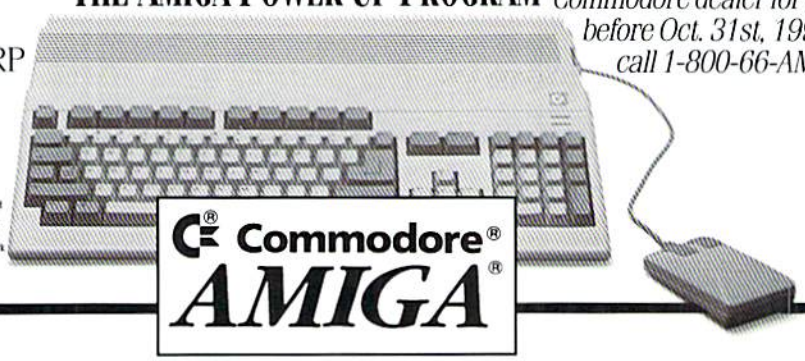

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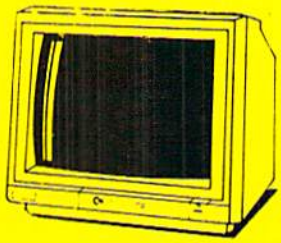

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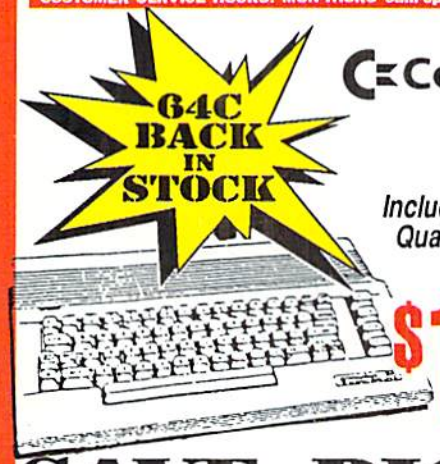

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